INSOMNIA

Family History of Insomnia in a Population-Based Sample

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Study Objectives: To examine the rates of family history of insomnia in a population-based sample composed of self-defined good sleepers and individuals with insomnia and compare individuals with and without family history of insomnia on several characteristics presumably associated with insomnia.

Design: Cross-sectional comparisons of self-defined good sleepers and individuals with insomnia selected from a larger epidemiologic study using a randomly selected sample of 2001 adults of the province of Québec in Canada.

Participants: Nine hundred fifty-three adults (60.3% women; mean age = 43.9 years) completed several postal questionnaires, including a survey of past and current history of insomnia/sleep disorders for self and first-degree relatives. Participants were classified as good sleepers, individuals with insomnia symptoms, or individuals with an insomnia syndrome.

Interventions: N/A.

Results: Of the total sample, 34.9% reported at least 1 first-degree relative with past or current insomnia. The mother was the most frequently afflicted first-degree relative with insomnia (19.7%). Family history rates of insomnia were not significantly different when individuals with current insomnia symptoms or syndrome were compared with self-defined good sleepers. However, significant group differences emerged when good sleepers were subdivided according to the presence or absence of past personal history of insomnia. Individuals with past or current insomnia were significantly more likely to report a family history of insomnia than were good sleepers who had never experienced insomnia in the past (39.1% vs 29.0%). Participants with a family history of insomnia endorsed higher scores on measures of insomnia severity, anxiety symptomatology, and arousal predisposition.

Conclusions: These findings provide additional evidence about the potential role of both family and personal history of insomnia as predisposing factors to insomnia. Longitudinal family studies are needed to further examine the relative contribution of genetic and environmental factors in the genesis and heritability of insomnia.

Keywords: Insomnia, sleep, epidemiology, family history, heredity, predisposition

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INSOMNIA IS A COMMON COMPLAINT IN THE GENERAL POPULATION.1 THE DIAGNOSIS OF INSOMNIA INVOLVES BOTH SLEEP SYMPTOMS, SUCH AS DIFFICULTY INITIATING OR maintaining sleep, and daytime symptoms, including fatigue, mood disturbance, and cognitive impairment. Insomnia may represent a transient problem triggered by specific life events, or, in contrast, it may also follow a chronic course due to the presence of both predisposing and perpetuating factors.

Several risk factors have been hypothesized in chronic insomnia such as age, sex, education, marital and work status, behavioral and environmental factors, and the presence of mental or medical disorders.2-8 However, little is known regarding the existence and influence of family history. Three studies have focused on this topic, and all suggest the potential involvement of a familial component in insomnia. One study found that 55% of individuals with childhood-onset and 39% of those with adulthood-onset insomnia reported at least 1 family member with sleep problems.9 However, the sample size was small (N = 56), the results were based on only 1 dichotomous (yes/no) question, and information was lacking on which relative was affected and by which sleep problem. In another study of 285 patients consulting for insomnia, 26.7% reported at least 1 family member with insomnia, and there were trends suggesting higher rates of family history of insomnia among patients with an earlier age of onset of insomnia.10 Finally, a recent study reported that a family history of insomnia was more prevalent among individuals with primary insomnia (72.7%) than among those with insomnia comorbid with a psychiatric disorder (43.3%) and healthy controls (23.5%).11 In summary, the available evidence is derived from relatively small samples composed of clinical patients attending a sleep clinic, and only 1 study used a control group.11

Several twin studies strongly suggest that genetic factors influence insomnia. Among those studies, the genetic effects accounted for approximately one third of the variance in insomnia complaints.12-14 Moreover, family history of insomnia seems to be more likely in cases of early onset of the condition.14 A genetic predisposition has also been established for normal sleep and for most other sleep disorders.15-17 Except for the rare fatal familial insomnia,16,17 only 1 genetic case study has been reported in literature, with a beta3 GABA(A) receptor mutation in a patient affected with a chronic familial insomnia.18 The presence of putative biologic factors needs to be discovered, with indication of different factors affecting early and late onset of insomnia. Due to a possible intermittent mode of entry in insomnia, the age of onset is not always easy to ascertain. In addition, transient insomnia may occur only in the presence of specific triggering factors. The
natural history of insomnia is not well documented, but the recurrence of such precipitating factors for a vulnerable person may increase the risk to develop chronic insomnia. We therefore hypothesize that a similar vulnerability exists in patients with transient and chronic insomnia that may be transmitted in families as a biologic trait.

The objectives of the present study were (1) to examine the rates of family history of insomnia in a population-based sample composed of self-defined good sleepers and individuals with past and current insomnia and (2) to compare individuals with and without family history of insomnia on several characteristics presumably associated with insomnia (i.e., depression, anxiety, and hyperarousal).

**METHOD**

**Study Context and Sample Selection**

This study was part of a larger epidemiologic study conducted in the province of Québec, Canada. The protocol was approved by the Université Laval’s ethics committee, and written informed consent was obtained from all participants enrolled in the longitudinal part of the study. The study began with a telephone survey, carried out by a professional pool firm, to document the prevalence of insomnia and patterns of consultations and treatments used for this condition. The target population for the survey was French-speaking residents aged 18 years and older. At the conclusion of the telephone interview, participants were asked if they wanted to take part in the longitudinal phase of the study, which involved completion of 4 postal evaluations over a 24-month period. The first postal evaluation, the one used in the present study, was conducted approximately 1 month after the telephone interview. The remaining 3 evaluations took part respectively 6, 12, and 24 months after the first postal evaluation. Those evaluations assessed sleep and insomnia, physical and mental health, quality of life, stress, anxiety, depression, and personality factors.

**Participants and Procedure**

Of the 5991 persons solicited, a total of 2001 (33.4%) respondents completed the telephone interview, and 1467 (73.3%) of those accepted to take part in the longitudinal study. Of this number, 105 (7.2%) were excluded because they reported the presence of a sleep disorder other than insomnia, the only exclusion criterion of the study. The first postal evaluation was mailed to 1362 participants, who were asked to return the completed questionnaire within a 2-week period. Telephone follow-ups were conducted afterward for those who had not yet returned the measures. Response rate was 73.2%, with 997 participants having returned the completed measures, for which they received a $25 monetary compensation. Based on the information from the questionnaire, 44 additional measures, for which they received a $25 monetary compensation. The final sample included 953 participants.

**Sleep Status Groups**

Participants were classified in 3 groups according to an algorithm based on a combination of insomnia diagnostic criteria from the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, 1994, and the International Classification of Diseases, 10th Edition, 2000, and on the utilization of sleep-promoting products (prescribed and over-the-counter). Responses from the Insomnia Severity Index (ISI), 21 the Pittsburgh Sleep Quality Index (PSQI), 22 and questions on utilization of sleep-promoting products were used to evaluate the presence or absence of each criterion.

The 3 sleep status groups were defined as follows. Insomnia syndrome. Participants in this group met all the diagnostic criteria for insomnia. They were dissatisfied with their sleep (i.e., dissatisfied [3] or very dissatisfied [4] on a 0-4 scale) and presented difficulties initiating or maintaining sleep at least 3 nights per week for a minimum duration of 1 month. Psychological distress or daytime impairment related to sleep difficulties was also reported by those individuals (i.e., much [3] or very much [4] on 0-4 scales). Finally, if prescribed medication was used as a sleep-promoting agent at least 3 nights per week, participants were automatically classified in the insomnia syndrome group whether or not they presented difficulties initiating or maintaining sleep. Insomnia symptoms. Participants classified in this group presented difficulties initiating or maintaining sleep at least 3 nights per week, without fulfilling all the diagnostic criteria of an insomnia syndrome (i.e., they could be satisfied with their sleep, they may not report distress or daytime consequences, or their sleep difficulties could last for less than 1 month). Also included in this group were individuals dissatisfied with their sleep quality but without difficulties initiating or maintaining sleep. Last, participants using prescribed medication fewer than 3 nights per week, or using over-the-counter medication at least 1 night per week, were automatically classified in this group. Good sleepers. These participants were satisfied with their sleep (i.e., very satisfied [0], satisfied [1], or neutral [2] on a 0-4 scale), did not report difficulties initiating or maintaining sleep and did not use prescribed or over-the-counter sleep medication.

**Measures**

**Family History of Insomnia**

One section of the sleep survey was concerned with current and past history of sleep disturbances for the respondent’s immediate family. The first question was: “Do any of your immediate family members presently have or ever had sleep difficulties?” For those answering in the affirmative, there were follow-up questions to specify which first-degree relative(s) had a sleep problem (i.e., mother, father, sister, brother, son, daughter), the type of sleep problem (i.e., insomnia, excessive daytime sleepiness, sleep apnea, restless legs syndrome), and whether the problem was current or occurred only in the past. A family history of insomnia was defined as a report of at least 1 parent or sibling with past or current insomnia.

**Past Personal History of Insomnia**

One question addressed past personal history of insomnia: “In the past, have you ever experienced insomnia a few days per week for more than one month? yes/no.”

**Other Sleep-Related Variables**

Another question was about consultations: “Have you ever consulted a health professional for sleep difficulties?” Use of
sleep aid was also assessed: “In the last 12 months, did you use prescribed medication for sleep?” The same question was repeated for over-the-counter medication, natural products, and alcohol used as sleep aids. Frequency of utilization of sleep-promoting products, which was used for the sleep status classification, was assessed with the following questions: “During the past month, how many nights per week have you taken prescribed medication to help you sleep?” and “During the past month, how many nights per week have you taken over-the-counter medication (e.g., Nytol, Sominex) to help you sleep?”

**Insomnia Severity Index**

The ISF was a 7-item questionnaire assessing the nature, severity, and impact of sleep difficulties. Dimensions evaluated are the severity of sleep-onset, sleep-maintenance, and early morning awakening problems; satisfaction regarding current sleep; interference of sleep difficulties with daytime functioning; noticeability of sleep problems by others; and distress caused by the sleep difficulties. A 5-point Likert scale (“0” = not at all, “4” = extremely) is used to rate each of these items, yielding to a total score ranging from 0 to 28. Scores can be classified in 4 severity categories: absence of insomnia (0-7), subthreshold insomnia symptoms (8-14), moderate insomnia (15-21), and severe insomnia (22-28). The ISI has adequate psychometric properties, and its French version has good internal consistency, test-retest reliability, and convergent validity ($r = 0.65$ when compared with sleep diary).

**Pittsburgh Sleep Quality Index**

The PSQI is a 19-item questionnaire evaluating sleep quality and disturbances over a 1-month time interval. The first 4 items are open questions, whereas items 5 to 19 are rated on a 4-point Likert scale. Individual items’ scores yield 7 components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep promoting medication, and daytime dysfunction. A total score, ranging from 0 to 21, can be obtained by adding the 7 component scores. A total score higher than 5 suggests poor sleep quality. Psychometric properties of the PSQI are adequate, with indices of sensitivity of $89.6\%$ and specificity of $86.5\%$ for psychophysiological insomnia. The validated French version has adequate psychometric properties as well.

**Beck Depression Inventory II**

The Beck Depression Inventory II (BDI-II) contains 21 items rating depression symptoms experienced during the past 2 weeks on a 4-point Likert scale. A total score is derived, ranging from 0 to 63, with a higher score suggesting more severe depression symptomatology. Psychometric properties of the French version of the BDI-II are well established.

**State-Trait Anxiety Inventory**

The State-Trait Anxiety Inventory (STAI) is a 2-part instrument assessing 2 different forms of anxiety. The State part evaluates anxiety as an emotional response to a situation, whereas the Trait part concerns anxiety as a personality trait. Only the Trait part (STAI-Trait) was used in the present study. The STAI-Trait comprises 20 items rated on a 4-point Likert scale (“1” = not at all, “4” = a lot). Participants have to answer how they relate to the statements in general. Psychometric properties of the STAI are excellent and well established. The validated French-Canadian adaptation was used in the present study.

**Arousal Predisposition Scale**

The Arousal Predisposition Scale (APS) is a 12-item inventory that has been designed to measure arousability. Respondents are asked to report the frequency with which they experience the proposed emotion or behavior on a 5-point Likert scale (“1” = Never, “5” = Always). The APS is a useful measure of individual differences in predisposition toward arousability and presents adequate internal consistency ($0.84$). A non-validated French-Canadian version of the measure was used.

**Statistical Analyses**

The primary dependent variable was the presence of a family history of insomnia, which was defined as reporting at least 1 parent or sibling with past or current insomnia. Rates of family history of insomnia were first compared across the 3 sleep status groups. Then, because the natural course of insomnia often involves successive episodes of remission and relapse, all participants who had experienced insomnia at one point in their life were considered as a single group. In order to achieve this, the group of good sleepers was subdivided into 2 subgroups: good sleepers without past personal history of insomnia and good sleepers with past personal history of insomnia (based on their response to the yes/no question: “In the past, have you ever experienced insomnia a few days per week for more than one month?”). Rates of family history of insomnia were compared between good sleepers without past personal history of insomnia and participants with past or current insomnia (i.e., good sleepers with past personal history of insomnia, insomnia symptoms, insomnia syndrome). For each comparison that reached statistical significance on the $\chi^2$ test, odds ratios (ORs) were computed for 2 × 2 contingency tables (rows, sleep status; columns, family history) to determine which sleep status groups differed from each other.

A secondary analysis consisted of dividing participants in 2 categories, according to whether or not they had a family history of insomnia, regardless of sleep status. Both groups were then compared on age, sex, previous consultations for sleep difficulties, prescribed medication, over-the-counter products or alcohol use as sleep aid in the previous year, and total scores on the ISI, PSQI, BDI-II, STAI-Trait, and APS. Odds ratios were computed for nominal variables and t-tests for continuous variables. All analyses were performed using SPSS for Windows (version 12.0, 2003; SPSS, Inc., Chicago, IL). The $\alpha$ level of significance was set at 0.05 (2-tailed).

**RESULTS**

**Description of the Sample**

Participants were 953 adults aged between 18 and 83 years ($M = 43.9$, $SD = 14.1$). They were predominantly women ($60.3\%$), Caucasian ($97.8\%$), married or involved in a common-law relationship ($58.1\%$), and either working or studying ($74.0\%$). Half...
the sample (50.7%) had more than 12 years of education. Regarding sleep status, 5 participants could not be classified in 1 of the 3 groups because of missing data. Of the remaining 948 participants, 493 (52.0%) were classified as good sleepers, 308 (32.5%) presented insomnia symptoms, and 147 (15.5%) met criteria for an insomnia syndrome. One-way analyses of variance, followed by posthoc tests (R-E-G-W F) revealed that these 3 groups were significantly different from each other for scores on the ISI (F
\text{2,945} = 573.27, P < 0.001) and PSQI (F
\text{2,945} = 447.90, P < 0.001) (see Table 1). Differences were in the expected directions, with participants with an insomnia syndrome displaying the highest scores, followed by those with insomnia symptoms, and then by good sleepers. Regarding sociodemographics, significant differences were found for age (F
\text{2,945} = 3.98, P = 0.02) and sex (χ² [2, n = 946] = 7.09, P = 0.03). Good sleepers were significantly younger than the insomnia syndrome participants, and there were significantly more women in the insomnia syndrome group than in the other 2 groups.

On the basis of the information gathered in the telephone survey, individuals who did not return the questionnaires (n = 365) were significantly younger (mean age of 39.9 years, SD = 15.4) (F
\text{1,1360} = 17.63, P < 0.0001) and included a lower proportion of women (51%) (χ² [1, n = 1362] = 7.5, P < 0.01) than responders (n = 997, including 44 who were excluded for sleep disorders other than insomnia). There were no significant differences between nonresponders and responders regarding marital status and education, but there was a significant difference regarding sleep satisfaction, with more nonresponders being dissatisfied with their sleep (28.8%) than responders (23.4%) (χ² [1, n = 1362] = 4.2, P < 0.05).

Table 1—Descriptive Statistics for Sleep Status Groups

<table>
<thead>
<tr>
<th>Sleep status</th>
<th>Good sleepers (n = 493)</th>
<th>Insomnia symptoms (n = 308)</th>
<th>Insomnia syndrome (n = 147)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td>42.64± (13.91)</td>
<td>44.35± (14.30)</td>
<td>46.14± (13.55)</td>
</tr>
<tr>
<td>Sex, women</td>
<td>58.0±</td>
<td>59.1±</td>
<td>70.1±</td>
</tr>
<tr>
<td>ISI</td>
<td>3.73± (3.21)</td>
<td>8.45± (4.35)</td>
<td>15.36± (4.09)</td>
</tr>
<tr>
<td>PSQI</td>
<td>3.58± (1.85)</td>
<td>6.13± (2.74)</td>
<td>10.18± (3.13)</td>
</tr>
</tbody>
</table>

Data are expressed as mean (SD), except sex, which is shown as a percentage. Means and percentages in the same row with different superscripts differ at P < 0.05 on the R-E-G-W F test (age, Insomnia Severity Index [ISI], Pittsburgh Sleep Quality Index [PSQI]) or χ² test for 2×2 tables (sex).

Table 2—Rates of Family History of Insomnia Across Sleep Status Groups, Odds Ratios and 95% Confidence Intervals

<table>
<thead>
<tr>
<th>Sleep status</th>
<th>Presence of family history</th>
<th>χ² comparing each sleep status to the reference group (good sleepers without past history of insomnia)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% (n)</td>
<td>OR (95% CI)</td>
</tr>
<tr>
<td>Good sleepers without past personal history of insomnia (n = 403)</td>
<td>29.0 (117)</td>
<td>1.00</td>
</tr>
<tr>
<td>Participants with past or current insomnia (n = 545)</td>
<td>39.1 (213)</td>
<td>1.57 (1.19 to 2.07)</td>
</tr>
<tr>
<td>Past insomnia</td>
<td>Good sleepers with past personal history of insomnia (n = 90)</td>
<td>48.9 (44)</td>
</tr>
<tr>
<td>Current insomnia (n = 455)</td>
<td>37.1 (169)</td>
<td>1.44 (1.08 to 1.93)</td>
</tr>
<tr>
<td>Insomnia symptoms (n = 308)</td>
<td>36.7 (113)</td>
<td>1.42 (1.03 to 1.94)</td>
</tr>
<tr>
<td>Insomnia syndrome (n = 147)</td>
<td>38.1 (56)</td>
<td>1.50 (1.01 to 2.24)</td>
</tr>
</tbody>
</table>

Presence of family history is defined as reporting at least 1 parent or sibling with past or current insomnia. OR refers to odds ratio; CI, confidence intervals.

*P < 0.05.

Rates of Family History of Insomnia

Of the 953 participants, 39.7% reported at least 1 first-degree relative (i.e., parent or sibling) with a past or current sleep problem. Insomnia (34.9%) was by far the most frequent sleep problem reported in first-degree relatives, followed by sleep apnea (4.6%), restless legs (2.6%), and excessive daytime sleepiness (2.4%).

The category “other sleep problem” was checked by 2.8% of participants. Participants could report more than 1 sleep problem for their relatives. The first-degree relative most frequently identified with past or current insomnia was the participant’s mother (19.7%), followed by sister (11.1%), father (7.5%), and brother (5.9%). For 2.2% of the sample, both parents had past or current insomnia.

Family history rates of insomnia were compared across the 3 sleep status groups; no significant differences were found between good sleepers (32.7%) and those with insomnia symptoms (36.7%) and insomnia syndrome (38.1%). However, significant differences were found when good sleepers were subdivided according to presence or absence of past personal history of insomnia (χ² [3, n = 948] = 14.97, P = 0.002; see Table 2). Indeed, participants with either past or current insomnia were significantly more likely to report a family history of insomnia, compared with participants who had never experienced insomnia (39.1% vs 29.0%; OR = 1.57, 95% confidence interval [CI] = 1.19 to 2.07). More specifically, good sleepers with past personal history of insomnia (48.9%; n = 90), as well as participants with insomnia symptoms (36.7%; n = 308) and insomnia syndrome (38.1%; n = 147), reported significantly higher rates of family history compared with good sleepers without past personal history of insomnia (29.0%; n = 403).

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Table 3—Rates of Family History of Insomnia for Each First-Degree Relative Across Sleep Status Groups

<table>
<thead>
<tr>
<th>First-degree relatives</th>
<th>Good sleepers</th>
<th>Insomnia symptoms</th>
<th>Insomnia syndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Without past personal history of insomnia</td>
<td>With past personal history of insomnia</td>
<td></td>
</tr>
<tr>
<td>Mother with insomnia</td>
<td>16.9</td>
<td>24.4</td>
<td>21.4</td>
</tr>
<tr>
<td>Father with insomnia</td>
<td>5.0</td>
<td>10.0</td>
<td>9.1</td>
</tr>
<tr>
<td>Both parents with insomnia*</td>
<td>0.7</td>
<td>1.1</td>
<td>4.2</td>
</tr>
<tr>
<td>At least 1 sister with insomnia</td>
<td>7.7</td>
<td>17.8</td>
<td>13.0</td>
</tr>
<tr>
<td>At least 1 brother with insomnia</td>
<td>4.0</td>
<td>8.9</td>
<td>6.5</td>
</tr>
</tbody>
</table>

Data are presented as percentages. Rates for “both parents with insomnia” with different superscripts differ at P < 0.05 on the χ² test for 2 × 2 tables.

Table 3 presents the rates of family history of insomnia for each first-degree relative (i.e., mother, father, both parents, sister, brother) compared across sleep status groups using the 4-group classification (i.e., subdivision of good sleepers with or without past personal history of insomnia). The only significant comparison was for percentages of participants reporting that both parents had insomnia (χ² [3, n = 948] = 10.42, P = 0.001). Subsequent analyses using 2 × 2 contingency tables revealed that good sleepers, either with or without past personal history of insomnia, were significantly less likely to report that both parents had past or current insomnia, compared with participants with insomnia symptoms but not compared with participants with an insomnia syndrome.

To examine the potentially confounding role of depression and anxiety in family history of insomnia, participants were classified as having either high or low depression and anxiety symptoms, and were then compared on rates of family history of insomnia. Eighty-nine participants (9.4%) had a high level of depression symptoms, defined as a score of 20 or more on the BDI-II, which represents moderate to severe depression symptoms. In the absence of similar standard cutoffs for the STAI-Trait, a high level of anxiety symptoms was defined as a score superior to 2 standard deviations above the mean of the total sample (M = 39.5, SD = 9.5), which corresponds to a score of 59 or more; 33 participants (3.5%) exceeded this cut-off. For depression, the percentages of participants reporting a family history of insomnia were very comparable and not significantly different between participants with high level (36.0%) and low level (35.0%) of symptoms (χ² [1, n = 949] = 0.032, P = 0.857). Similar results were obtained for anxiety: 33.3% of participants with a high level of symptoms reporting a family history of insomnia, compared with 35.1% for those with a lower level of symptoms (χ² [1, n = 947] = 0.045, P = 0.833).

Comparison of Individuals with and without Family History

Table 4 shows the characteristics of participants with or without family history of insomnia. A significant difference was found for age (t[947] = 4.46, P < 0.001): participants with a family history of insomnia were younger (M = 41.02) than those without (M = 45.23). Groups differed as well on sex, with women being 1.91 times more likely than men to report a family history of insomnia (χ² [1, n = 951] = 20.21, P < 0.001). Participants with a family history were more likely to have consulted a health professional for sleep difficulties (χ² [1, n = 953] = 7.96, P = 0.005), but there were no between-group differences for the percentages of participants who had used prescribed medication or alcohol as a sleep aid in the previous year. However, participants with a family history were 1.95 times more likely than those without to have used natural or over-the-counter products as sleep aids in the last year (χ² [1, n = 952] = 17.45, P < 0.001). Finally, participants with family history of insomnia displayed significantly higher scores on the ISI (t[951] = -3.57, P < 0.001), PSQI (t[951] = -2.58, P = 0.01), STAI-Trait (t[951] = -2.73 P = 0.006), and APS (t[951] = -3.01, P = 0.003). There were no significant between-groups differences for the BDI-II.

DISCUSSION

This study was intended to examine further the relationship between a family history of insomnia and the presence of insomnia in a population-based sample. The findings indicate that individuals with either past or current insomnia are more likely to report a positive family history of insomnia than are individuals without any history of insomnia. Despite some methodologic limitations, these findings add to the limited available evidence suggesting that both a past history of insomnia, as well as a positive family history, may predispose to the development of persistent insomnia.

The overall 34.9% rate of insomnia among first-degree relatives of the total sample is comparable to prevalence rates of insomnia in most epidemiologic studies. The female sex of first-degree relatives (mother, sister) most frequently affected with insomnia is also consistent with the epidemiologic literature generally reporting a 2 (women) to 1 (men) sex ratio of insomnia in the general population. Among those with current insomnia symptoms or syndrome, the aggregated rate of family insomnia (37%) was comparable to the 35% rate obtained in one of our previous studies but was significantly lower than that of another study (55.8%). Direct comparisons of these findings are difficult, however, because both of these investigations used clinical samples, whereas the current study used a population-based sample.

Rates of family history of insomnia were surprisingly not significantly different between individuals with insomnia (37%) and self-defined good sleepers (33%). This comparison became significant only when individuals with a prior history of insomnia were excluded from the good sleepers group (37% vs 29%). These results highlight the importance of a past personal history of insomnia as an important variable associated with future insomnia episodes; it also points out the need to take this variable...
underlying comorbid psychiatric disorder. Future studies should investigate the contribution of genetic and environmental factors in the pathogenesis of insomnia. The overall 35% rate of first-degree relatives identified with insomnia lends additional support to the potential role of a familial predisposition to insomnia. More importantly, the presence of a past history of insomnia, either with or without current insomnia, serves as a new and interesting candidate for future research examining phenotype and risk factors in insomnia.

Some methodologic caveats preclude drawing clear conclusions about the potential role of a personal or family history in developing insomnia. The main limitation concerns the lack of information regarding the presence of comorbid conditions. Specifically, depression and anxiety, which are very prevalent among individuals with insomnia, were not controlled for in the participants or their relatives. Given that such disorders can also be inherited, it remains unclear whether potential links between insomnia and family history are unique to insomnia or reflect an underlying comorbid psychiatric disorder. Future studies should carefully evaluate the presence of comorbid psychiatric, as well as medical and other sleep disorders in order to further clarify and distinguish the role of a past personal and family history in both primary and comorbid insomnia. Another limitation of the study is that sleep patterns and insomnia were based exclusively on participants’ perception, and there was no direct assessment of the relatives’ sleep to validate those reports. Objective and comprehensive assessment of participants (e.g., with polysomnographic recordings and face-to-face diagnostic interviews) and direct evaluation by interviews with family members are conceivably the next methodologic bases for research on heritability of insomnia. Finally, another limitation, inherent to this type of study, pertains to the possibility that the participants presented characteristics that were different from those of the general population (e.g., higher proportion of women, of individuals dissatisfied with their sleep quality, of individuals interested in sleep).

Despite these limitations, this is the first population-based study to examine the role of family history in insomnia. The findings add to the limited evidence previously obtained from studies using selected clinical samples of individuals with insomnia. The overall 35% rate of first-degree relatives identified with insomnia lends additional support to the potential role of a familial predisposition to insomnia. More importantly, the presence of a past history of insomnia, either with or without current insomnia, emerged as a new and interesting candidate for future research examining phenotype and risk factors in insomnia.

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Table 4—Comparison of Individuals With and Without Family History of Insomnia

<table>
<thead>
<tr>
<th></th>
<th>Without family history (n = 620)</th>
<th>With family history (n = 333)</th>
<th>P Value for χ² test</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (women)</td>
<td>55.0%</td>
<td>70.0%</td>
<td>&lt; 0.001*</td>
<td>1.91 (1.44 to 2.53)</td>
</tr>
<tr>
<td>Consultations for sleep difficulties</td>
<td>16.0%</td>
<td>23.4%</td>
<td>0.005*</td>
<td>1.61 (1.16 to 2.24)</td>
</tr>
<tr>
<td>Use of sleep aid (previous year)</td>
<td>12.1%</td>
<td>11.1%</td>
<td>0.652</td>
<td>0.91 (0.60 to 1.38)</td>
</tr>
<tr>
<td>Natural/over-the-counter products</td>
<td>17.0%</td>
<td>28.5%</td>
<td>&lt; 0.001*</td>
<td>1.95 (1.42 to 2.68)</td>
</tr>
<tr>
<td>Alcohol</td>
<td>7.3%</td>
<td>10.2%</td>
<td>0.114</td>
<td>1.46 (0.91 to 2.32)</td>
</tr>
</tbody>
</table>

Family history is defined as reporting at least 1 parent or sibling with past or current insomnia. Odds ratios (OR) were computed for 2 × 2 contingency tables comparing the level displayed in the table to the reference level (i.e., male sex; individuals who did not consult for sleep difficulties; nonusers of sleep aids). ISI refers to Insomnia Severity Index; PSQI, Pittsburgh Sleep Quality Index; BDI-II, Beck Depression Inventory-II; STAI, State-Trait Anxiety Inventory; APS, Arousal Predisposition Scale.

*Groups differed at P < 0.05.