

Prevalence and Treatment of Insomnia in General Practice

A Longitudinal Study

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Summary. The aim of the study was to assess prevalence and treatment modalities of insomnia in general practice. To investigate the course of insomnia, a longitudinal study design was adopted. Two thousand five hundred and twelve patients (age 18–65 years) were investigated with a questionnaire in general practice (T1). Four months later (T2) and again 2 years later (T3) a questionnaire was sent to all patients who had complained about severe insomnia at the time of the first inquiry. To assess insomnia, operationalized diagnostic criteria were applied (DSM-III-R). Eighteen point seven percent suffered from severe, 12.2% suffered from moderate and 15% suffered from mild insomnia. In the course of 2 years insomnia appeared as a chronic health problem. A high comorbidity of severe insomnia was found with chronic somatic and psychiatric disorders, especially with depression. Of the severely insomniac patients, 23.9% used prescribed hypnotics habitually, mainly benzodiazepines. The use of prescribed hypnotics remained rather stable during the whole study period. More than half of the patients reported a daily use of the hypnotics for 1–5 years or longer, but only 22% of the severely insomniac patients reported at the time of the third inquiry a significant improvement of insomnia due to the administration of sleeping pills. Thus, the long-term administration of benzodiazepine hypnotics seems to be an inadequate treatment strategy in chronic insomnia. Whether the occurrence of rebound insomnia after benzodiazepine withdrawal may be one of the main factors for chronic hypnotic use requires discussion. Although insomnia may be an important symptom of many somatic and psychiatric disorders, the general practitioner was unaware in more than half of the cases that the patients suffered from a sleep problem. Severe insomniac patients displayed a higher mean number of medical consultations compared with good sleepers or patients with mild insomnia, indicating that insomnia constitutes a significant burden for the primary care physicians.

Key words: Insomnia – General practice – Benzodiazepine prescribing

1 Introduction

Several community studies have indicated that insomnia is a common health problem. About 30% to 35% of the general population seem to suffer from insomnia (Karacan et al. 1976, 1983, Bixler et al. 1979, Welstein et al. 1983, Mellinger et al. 1985). The studies, however, yielded different prevalence rates ranging from 13.4% (Lugaresi et al. 1983) to 48% (Karacan et al. 1983). A comparison of the single investigations is difficult as in general no operationalized diagnostic criteria were applied to assess diagnosis of insomnia (Karacan et al. 1983, Liljenberg et al. 1988). Few epidemiological studies have been done to assess the prevalence of insomnia in German-speaking countries. In a representative community survey (Upper Bavarian Field Study), Weyerer and Dilling (1991) found the prevalence of insomnia to be 28.5% but also without having used strictly operationalized diagnostic criteria for insomnia. To provide adequate treatment for insomniac patients it is necessary to have a knowledge of the prevalence and treatment modalities, especially in general practice, as the majority of insomniacs are treated by general physicians. Furthermore, the results of such a study in general practice would indicate the importance of insomnia for the health-care system and are necessary for further planning of sleep disorder centers and training programs for medical students, psychologists and physicians. Thus, more information is required on the relevance of insomnia in general practice. On the other hand, longitudinal studies are needed to assess the duration of insomnia and treatment throughout the course of the disorder. The only longitudinal community studies we are aware of followed a cohort of adolescents (Angst et al. 1989) and young adults between the ages of 20 and 30 years (Strauch et al. 1973) and only one study on

adults of different age has investigated the prevalence of insomnia and its comorbidity with psychiatric disorders in the community in a longitudinal study design (Ford et al. 1989). For all these reasons we carried out a longitudinal study in general practice in the Mannheim area.

The aim of our study was to investigate:

- (1) the prevalence of insomnia in general practice according to operationalized diagnostic criteria and its comorbidity with somatic and psychiatric disorders,
- (2) the course of insomnia during a study period of two years,
- (3) the treatment of insomnia during the course of the disorder, and
- (4) the awareness of the general physician of the patient's sleep problems.

2 Subjects and Methods

The study encompasses three points of data collection. The first inquiry (T1) was performed in the offices of ten general practitioners in the Mannheim area. At this time, 2512 patients (aged 18–65 years) received a questionnaire which was distributed consecutively to all patients who consulted their physician because of a health problem. To avoid a selection bias, a maximum of 300 patients per office were investigated during a study period of 4 months. Patients gave information on demographic data, sleep habits and sleep problems, use of hypnotics and on psychosocial stressors within the 6 months preceding the inquiry. The general physician gave information on somatic and psychiatric disorders, prescription of drugs, frequency of consultation and his awareness or lack thereof of a patient's sleep problem. All patients gave their written consent to participate in the study. The main purpose of the first inquiry was to get reliable data on the prevalence and the intensity of insomnia as well as on the treatment habits of general physicians and their awareness of the sleeping problem.

At the second inquiry (T2) 4 months later, all patients classified as suffering from severe insomnia were contacted by mail and received the same questionnaire as at T1. Data from the physician were not collected at T2. To compensate for that, patients were asked what they judged their health status to be at T2. Patients could judge their health status as very good/good/moderate/bad or very bad.

At the third inquiry (T3), 2 years after T1, a reduced version of the questionnaire was sent to all patients suffering from severe insomnia at T1. The brief questionnaire assessed the persistence of the sleep problems. Severely insomniac patients who had been using prescribed hypnotics were asked how long and how often they were using their sleeping pills and what they judged the effect of the hypnotics on insomnia to be.

To assess prospectively the chronicity of insomnia and hypnotic use, only the patients who responded to all three requests (T1, T2, T3) were included in the data analysis ($n = 285$). Thus, the longitudinal sample consisted of 285 patients and all statistics of the longitudinal evaluation are given on this basis. To avoid a splitting of the patient sample into many small subgroups in the analysis of the prospective data on the duration of insomnia, we subdivided the patient sample into two groups – one group with no/mild insomnia and one group suffering from moderate/severe insomnia.

Insomnia was assessed with the aid of questions on the difficulties of initiating or maintaining sleep, early morning awakening, impairment of daytime functioning and well-being due to the sleep problem. Patients were asked about frequency and duration of the sleep problem. Sleep latency, that is the time from lights off to the occurrence of sleep, and sleep duration according to the subjective perception of the patients were quantified.

Table 1. Diagnostic criteria for insomnia disorders according to DSM-III-R

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- A. The predominant complaint is of difficulty in initiating or maintaining sleep, or of nonrestorative sleep (sleep that is apparently adequate in amount, but leaves the person feeling unrested).
 - B. The disturbance in A occurs at least three times a week for at least 1 month and is sufficiently severe to result in either a complaint of significant daytime fatigue or the observation by others of some symptom that is attributable to the sleep disturbance, e.g., irritability or impaired daytime functioning.
 - C. Occurrence not exclusively during the course of Sleep-Wake Schedule Disorder or a Parasomnia.
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Operationalized diagnostic criteria were applied to assess the diagnosis of insomnia. Insomnia was classified according to its severity as:

- (1) no insomnia,
- (2) mild insomnia (occasional difficulties in initiating and maintaining sleep),
- (3) moderate insomnia (this category fulfilled diagnostic criteria of insomnia according to DSM-III R without reporting impairment of daytime functioning), and
- (4) severe insomnia (this category fulfilled diagnostic criteria according to DSM-III R [(American, Psychiatric Association 1987), Table 1]).

The drug treatment at T1 was assessed in three different ways. First by the following question, answered by the patient: "Did you use hypnotics within the last 4 weeks?" A hypnotic was defined as any drug taken to promote sleep. Second, the patients were requested to name the hypnotic they used, if they were able to remember it. The list of named hypnotics then could be classified into different types of prescribed and over-the-counter hypnotics. Third, the general physician gave information about prescription of hypnotics within the last 4 weeks. Additionally, the general practitioner was asked whether he knew about a patient's sleep problem.

To assess comorbidity of insomnia with psychiatric disorders, the general physician was requested to judge whether the patient had a psychiatric disorder and had then to decide to which of the following diagnostic subgroups the patient belongs (depression, other forms of neurosis or personality disorder, psychosomatic disorder, alcohol or drug abuse, acute psychological distress, psychotic disorder, organic brain syndrome).

Statistics

As all data are frequencies of categorical variables, cross tabulations were used for statistical analysis to detect the relation between two variables. To evaluate the degree of the relationship between two variables the contingency coefficient was computed. Differences between groups were tested for statistical significance by computing chi square values. For all results $P \leq 0.01$ was required for statistical significance.

3 Results

At T1 the refusal rate was 2.1%. At T2, 14.7% could not be contacted because the address was unknown, 11.8% refused to participate in the study (attrition rate = 26.5% related to the sample at T1). The rate of attrition at T3 was 32.4% related to T1.

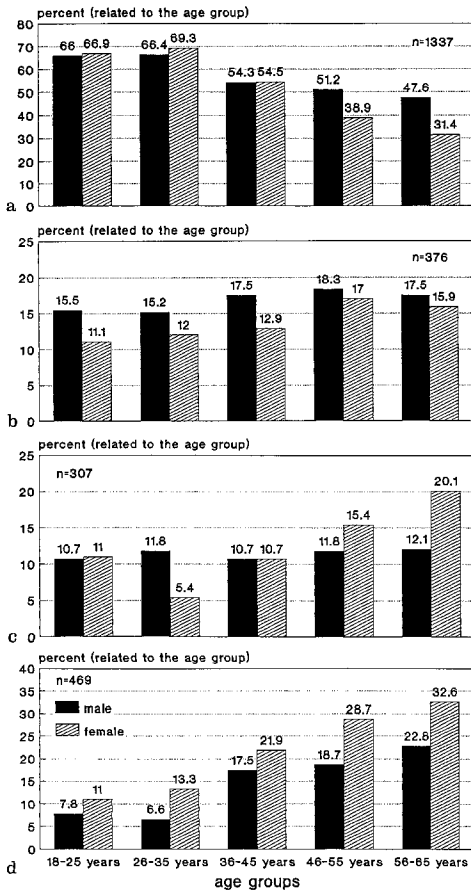


Fig. 1a-d. Age and sex distribution of patients with no (a), mild (b), moderate (c) and severe (d) insomnia at T1

Of the whole sample of 2,512 patients, 55.3% were female, 44.7% were male, females being slightly over-represented compared with the general German population in 1987 (50.02% females, 49.98% males). Concerning age, younger persons (<45 years) were slightly under-represented (3–4% in the different age groups), while the older age groups (>45 years) corresponded compared to the age distribution of the general German population (in 1987).

3.1 Prevalence of Insomnia

At T1, 18.7% ($n = 469$) suffered from severe, 12.2% ($n = 307$) suffered from moderate and 15% ($n = 376$) suffered from mild insomnia. Fifty-three point two percent ($n = 1,337$) were completely satisfied with their sleep, while 0.9% ($n = 23$) reported suffering from hypersomnia (possible numeric deviations in the following paragraphs are due to missing values). Within the group of severely insomniac patients 35% ($n = 154$) were male and 65% ($n = 291$) were female. Figure 1 displays age and sex distribution according to different age groups for no, mild, moderate and severe insomnia. Only in the group with severe insomnia did females prevail significantly in almost all age groups. The increase of insomnia with age was most pronounced in the severe insomniac patients and absent in the group with mild insomnia.

Table 2. Duration of severe insomnia in the course of 2 years (T1, T2, T3)

	T2: after 4 months (short-term)		Σ T3:
	No/mild	Moderate/severe	
T3: after 2 years (long-term)			
No/mild	$n = 44$ 15%	$n = 93$ 33%	$n = 137$ 48%
Moderate/severe	$n = 28$ 10%	$n = 120$ 42%	$n = 148$ 52%
Σ T2:	$n = 72$ 25%	$n = 213$ 75%	$n = 285$ 100%

3.2 Awareness of the General Physician and Frequency of Medical Consultations

In 8.8% of patients with mild, in 21.9% of moderate and in 39.2% of patients with severe insomnia, the general physician was aware of the patient's sleep problem. In 5% he diagnosed insomnia, but the patient did not complain about disturbed sleep in the questionnaire.

The mean frequency of medical consultations within the last 3 months was 3.2 consultations for good sleepers, 3.6 consultations for patients with mild, 3.8 consultations for patients with moderate and 4.7 consultations for patients with severe insomnia.

3.3 Duration of Insomnia

Two types of data were available to assess the chronicity of insomnia: the patient's retrospective self-rating of the duration of the sleeping problem at T1 on the one hand, and the prospective follow-up assessment of those patients with severe insomnia at T1 for 2 years, on the other hand.

Retrospectively, at T1, 42% of the severely insomniac patients stated having suffered from insomnia for more than 5 years, 35% for 1–5 years, 9% for 6–12 months and 14% for less than 6 months. Thus, more than 2/3 of the patients suffering from severe insomnia at T1 reported a chronic course of the disorder for more than 1 year.

For prospective evaluation, all patients complaining about severe insomnia at T1 who had responded to all three requests ($n = 285$) were included in the data analysis to investigate the course of the sleep disorder (Table 2).

At T2, 75% of these patients ($n = 213$) still suffered from moderate or severe insomnia, while 25% ($n = 72$) reported mild insomnia or showed a complete remission in a period of 4 months.

Two years later at T3, 52% ($n = 148$) of the patients with severe insomnia at T1 complained about moderate or severe insomnia, while 48% ($n = 137$), showed mild insomnia or reported no sleep problem at all.

Over the entire study period, 42% ($n = 120$) of the patients reported severe insomnia at all three times of request. Thirty-three percent ($n = 93$) reported that the sleep problem had changed from moderate/severe insomnia at T2 to no/mild insomnia by T3. Fifteen percent

Table 3a and b. Sleep quality of insomniac patients and good sleepers at T1

	Insomnia			
	No	Mild	Moderate	Severe
a Sleep latency				
Under 15 min	<i>n</i> = 820 62.0%	<i>n</i> = 98 26.2%	<i>n</i> = 47 15.4%	<i>n</i> = 57 12.3%
15–30 min	<i>n</i> = 493 37.3%	<i>n</i> = 240 64.2%	<i>n</i> = 108 35.4%	<i>n</i> = 141 30.5%
30–60 min	<i>n</i> = 9 0.7%	<i>n</i> = 27 7.2%	<i>n</i> = 112 36.7%	<i>n</i> = 164 35.4%
More than 60 min	<i>n</i> = 1 0.7%	<i>n</i> = 9 2.4%	<i>n</i> = 38 12.5%	<i>n</i> = 101 21.8%
Contingency coefficient 0.57, <i>P</i> < 0.001				
b Sleep duration				
Under 4 h	<i>n</i> = 3 0.2%	<i>n</i> = 8 2.2%	<i>n</i> = 32 10.7%	<i>n</i> = 89 19.6%
4–6 h	<i>n</i> = 229 17.4%	<i>n</i> = 93 25.3%	<i>n</i> = 168 56.0%	<i>n</i> = 221 48.7%
6–8 h	<i>n</i> = 974 74.2%	<i>n</i> = 247 67.1%	<i>n</i> = 95 31.7%	<i>n</i> = 120 26.4%
8–12 h	<i>n</i> = 107 8.1%	<i>n</i> = 20 5.4%	<i>n</i> = 5 1.7%	<i>n</i> = 24 5.3%
Contingency coefficient 0.46, <i>P</i> < 0.001				

Table 4. Health status and insomnia according to the patient at T2

Health status	Insomnia			
	No	Mild	Moderate	Severe
Very good	<i>n</i> = 3 5.8%			<i>n</i> = 1 0.5%
Good	<i>n</i> = 24 49.0%	<i>n</i> = 14 46.7%	<i>n</i> = 13 27.1%	<i>n</i> = 24 11.4%
Moderate	<i>n</i> = 20 40.8%	<i>n</i> = 14 46.7%	<i>n</i> = 29 60.4%	<i>n</i> = 126 60.0%
Bad	<i>n</i> = 2 4.1%	<i>n</i> = 2 6.7%	<i>n</i> = 5 10.4%	<i>n</i> = 52 24.8%
Very bad			<i>n</i> = 1 2.1%	<i>n</i> = 7 3.3%

Contingency coefficient 0.41, *P* < 0.001**Table 5.** Association between insomnia and psychiatric disorders at T1

Insomnia	Psychiatric disorders total ^b	Depression	Neurosis/personality disorders	Acute psychological distress	Alcohol drug abuse	Psychosomatic disorders	Psychosis	Organic brain syndrome
No	<i>n</i> = 101 9.9%	<i>n</i> = 38 3.7%	<i>n</i> = 23 2.3%	<i>n</i> = 30 3.0%	<i>n</i> = 13 1.3%	<i>n</i> = 17 1.7%	<i>n</i> = 5 ^a 0.5%	<i>n</i> = 3 ^a 0.3%
Mild	<i>n</i> = 40 13.5%	<i>n</i> = 23* 8.0%	<i>n</i> = 5 ^a 1.7%	<i>n</i> = 7 ^a 2.4%	<i>n</i> = 6 ^a 2.1%	<i>n</i> = 4 ^a 1.4%	–	<i>n</i> = 1 ^a 0.3%
Moderate	<i>n</i> = 54** 20.7%	<i>n</i> = 18** 7.0%	<i>n</i> = 10 3.9%	<i>n</i> = 20** 7.8%	<i>n</i> = 7 ^a 2.7%	<i>n</i> = 8 ^a 3.1%	–	<i>n</i> = 4 ^a 1.6%
Severe	<i>n</i> = 150** 37.4%	<i>n</i> = 85** 21.7%	<i>n</i> = 28** 7.2%	<i>n</i> = 40** 10.2%	<i>n</i> = 18** 4.6%	<i>n</i> = 22** 5.6%	<i>n</i> = 4 ^a 1.0%	<i>n</i> = 5 ^a 1.3%

* = *P* < 0.01** = *P* < 0.001^a = no statistics due to small *n*^b = double diagnosis were possible

(*n* = 44) showed a remission of their sleep problem from T1 (severe insomnia) to T2 (no/mild insomnia). On the other hand, 10% (*n* = 28) of the patients who had recovered from severe insomnia at T1 to no/mild insomnia at T2 had relapsed into moderate/severe insomnia by T3.

3.4 Sleep Quality

Table 3 displays sleep quality for good sleepers and patients with mild, moderate and severe insomnia. Sleep quality was assessed by means of sleep latencies, that is the time from lights out to falling asleep, and sleep duration, that is the total sleep time per night according to the subjective perception of the patients. While the majority of the good sleepers reported sleep latencies under 15 min, patients with mild insomnia mainly stated having fallen asleep within 15–30 min and patients with moderate and severe insomnia mainly reported sleep latencies of 30–60 min and longer. Concerning sleep duration, the majority of the good sleepers and the patients with mild insomnia slept 6–8 h, while most of the patients with moderate and severe insomnia reported a sleep duration of 4–6 h or less (sleep latency: contingency coefficient 0.45, *P* < 0.001, sleep duration: contingency coefficient 0.35, *P* < 0.001).

3.5 Comorbidity with Somatic Disorders

The relation between insomnia and acute somatic disorders according to the diagnosis of the general physician could not be investigated owing to the fact that a duration of 4 weeks was required to assess the diagnosis of insomnia according to DSM-III-R. Moderate insomnia (*P* < 0.01) and severe insomnia (*P* < 0.001) were significantly associated with chronic somatic disorders, while no significant association was found with mild insomnia (data not shown).

Four months later (T2), we asked all moderate and severe insomniacs what they judged their health status to be, as we had no opportunity to obtain a diagnosis from the general physician. While the majority of the patients who reported no sleep problem or just a mild insomnia at T2 judged their health status as “good” or “moder-

Table 6. Use of hypnotics according to the patient at T1

	Insomnia			
	No	Mild	Moderate	Severe
Over-the-counter	<i>n</i> = 5 0.4%	<i>n</i> = 11 3.0%	<i>n</i> = 19 6.5%	<i>n</i> = 31 6.8%
Prescribed hypnotics	<i>n</i> = 5 0.4%	<i>n</i> = 9 2.4%	<i>n</i> = 18 6.1%	<i>n</i> = 109 23.9%

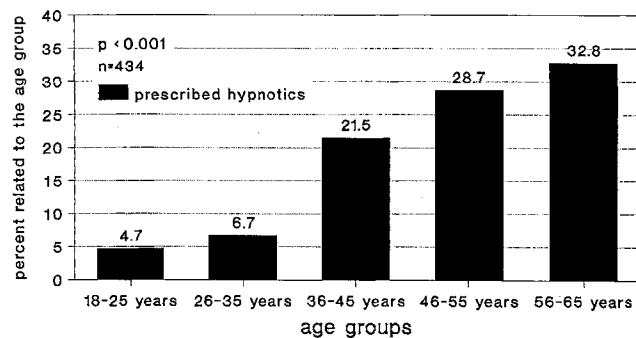
Contingency coefficient 0.38; $P < 0.001$

Table 7. Use of hypnotics and other psychoactive drugs according to the general physician at T1

	Insomnia			
	No	Mild	Moderate	Severe
Over-the-counter	<i>n</i> = 5 0.4%	<i>n</i> = 3 0.8%	<i>n</i> = 8 2.6%	<i>n</i> = 22 4.7%
Prescribed hypnotics ^a	<i>n</i> = 14 1.0%	<i>n</i> = 8 2.1%	<i>n</i> = 16 5.2%	<i>n</i> = 55 11.7%
Prescribed hypnotics and other psychopharmac ^b	<i>n</i> = 25 1.9%	<i>n</i> = 13 3.5%	<i>n</i> = 24 7.8%	<i>n</i> = 76 16.2%

^a Contingency coefficient 0.21, $P < 0.001$

^b Contingency coefficient 0.23, $P < 0.001$

**Fig. 2.** Severe insomnia and the use of prescribed hypnotics according to the patients at T1

ate”, patients with moderate insomnia stated mainly a “moderate” health status, while patients with severe insomnia mostly reported a “moderate” or “bad” health status. The contingency coefficient revealed a highly significant relationship between disturbed sleep and complaint about impaired health status (contingency coefficient 0.41, $P < 0.001$). The data are displayed in Table 4.

3.6 Comorbidity with Psychiatric Disorders

The general physician established the diagnosis of a psychiatric disorder according to a list including seven different psychiatric diagnoses (double diagnosis was possible). Except for depression, there was no significant association between mild insomnia and psychiatric disorders. However, the comorbidity with a psychiatric disorder among respondents with moderate insomnia was twice as high and among those with severe insomnia about

Table 8. Use of prescribed hypnotics in the course of 2 years (severe insomnia) according to the patients

T1		T2 After 4 months		T3 After 2 years	
Males	Females	Males	Females	Males	Females
<i>n</i> = 15 15.8%	<i>n</i> = 50 27.3%	<i>n</i> = 16 16.8%	<i>n</i> = 41 22.4%	<i>n</i> = 13 13.7%	<i>n</i> = 35 19.1%

Table 9. Frequency of the use of prescribed hypnotics per week (severe insomnia) at T3

Once	Twice	Three times	Four times	Five times	Six times	Every day
<i>n</i> = 7 13%	<i>n</i> = 4 8%	<i>n</i> = 3 6%	<i>n</i> = 6 11%	<i>n</i> = 2 4%	<i>n</i> = 2 4%	<i>n</i> = 29 54%

four times higher in comparison to those without a sleep problem (Table 5). A highly significant association between moderate/severe insomnia and psychiatric disorders as a whole was found; the contingency coefficient revealed a highly significant relationship between a sleep problem and psychiatric disorders (contingency coefficient 0.27, $P < 0.001$). Regarding different diagnostic subgroups, severe insomnia showed consistently a highly significant association with all psychiatric diagnoses, while moderate insomnia was only associated with the diagnosis of depression and acute psychological distress. The association between insomnia and depression was particularly strong.

3.7 Treatment of Insomnia

Patients were asked whether they took hypnotics within one month prior to the interview. Table 6 displays the use of hypnotics in no, mild, moderate and severe insomnia according to the patient. Patients with severe insomnia clearly used more prescribed hypnotics compared to good sleepers and mild/moderate insomniac patients.

Of all prescribed hypnotics named by the patient, 80.3% were benzodiazepines, prevailing by far over antidepressants, neuroleptics and other drugs. According to the general physician (Table 7), 11.7% of the severely insomniac patients were taking prescribed hypnotics. Of these hypnotics named by the general practitioner, 83.0% were benzodiazepines. Combining hypnotics and other psychoactive drugs not especially prescribed by the general physician to promote sleep, 16.2% of the severely insomniac patients were treated with psychopharmac. The prescription rate of hypnotics and other psychoactive drugs such as neuroleptics, antidepressants and others together among the patients with severe insomnia was clearly higher than that for good sleepers and patients with mild and moderate insomnia.

Patients with severe insomnia and a psychiatric diagnosis according to the general physician took by far more prescribed hypnotics ($n = 61$, 41.2%), mainly benzo-

Table 10. Chronicity of hypnotic intake (severe insomnia) at T3

1 month	1–6 months	6–12 months	1–5 years	Over 5 years
<i>n</i> = 6 11%	<i>n</i> = 6 11%	<i>n</i> = 8 15%	<i>n</i> = 20 38%	<i>n</i> = 13 25%

Table 11. Effect of prescribed hypnotics (severe insomnia) at T3

Significant- ly worse	Somewhat worse	No change	Somewhat better	Significant- ly better
<i>n</i> = 1 2%	<i>n</i> = 4 8%	<i>n</i> = 18 34%	<i>n</i> = 18 34%	<i>n</i> = 12 22%

diazepines, compared with the mildly and moderately insomniac patients who also were diagnosed as suffering from a psychiatric disorder. As prescribed hypnotics were mainly used by severely insomniac patients, the subsequent data concern only this patient group. The use of hypnotics increased with age (Fig. 2).

Table 8 displays the use of prescribed hypnotics in the course of 2 years according to sex. The pattern of hypnotics' use was rather stable during the whole study period for the patient sample who responded to all three requests (*n* = 285). Females took more hypnotics compared to males at all times of the inquiry.

At T3, more than half of the patients reported retrospectively a daily use of hypnotics (Table 9). Furthermore, nearly two thirds reported to use hypnotics for 1–5 years or longer (Table 10). Only 22% of the severely insomniac patients reported a significant improvement of insomnia due to the administration of sleeping pills, while 34% reported that insomnia was somewhat better. Of the severe insomniacs, 34% observed no effect of the sleeping pills on sleep quality (Table 11).

All patients who took prescribed hypnotics had tried to reduce the dose or to discontinue the drug, but 81% reported a worsening of night sleep after reduction or discontinuation of the hypnotic.

4 Discussion

The results of our study demonstrate that insomnia is a common health problem in general practice. Every fifth person aged 18–65 years who consulted the general physician for health problems suffered from a sleep problem severe enough to cause impairment of daytime functioning and only half of the patients did not complain of any sleep problem at all. Nevertheless, the prevalence rate of severe insomnia in our study is lower compared with community surveys, which found prevalence rates with a mean of about 35% (Karacan et al. 1976, 1983, Bixler et al. 1979, Welstein et al. 1983, Mellinger et al. 1985, Weyerer and Dilling, 1991), although we investigated outpatients, for whom we would expect a higher prevalence of insomnia due to a possible underlying health problem. The higher prevalence rates found in earlier community surveys may be explained by

the lack of operationalized diagnostic criteria defined in internationally recognized diagnostic classification systems used in these studies. Survey questions have included the following: "How often do you have trouble sleeping?", "Has trouble falling asleep or trouble staying asleep bothered you in the past 12 months?" or "Do you sleep well without sleeping pills?". Liljenberg et al. (1988) and Karacan et al. (1976) discussed the importance of operationalized diagnostic criteria for the assessment of insomnia. Impairment of daytime functioning due to disturbed night sleep should be included in the diagnostic criteria. Liljenberg et al. (1988) found that the prevalence figures were three times higher when the criteria were limited to symptoms occurring only in the evenings and at night, i.e. difficulties in initiating and maintaining sleep, than when daytime symptoms, i.e. impaired daytime functioning and well-being, had been included. In our study, DSM-III-R criteria, which include impairment of daytime functioning, had been applied to assess severe insomnia. Without considering the impact of disturbed sleep on daytime well-being, the prevalence of insomnia rises from 19% to 31% when daytime symptoms are not considered, and even to 46% when occasional difficulties in initiating and maintaining sleep are included. Thus, internationally accepted operationalized diagnostic criteria such as DSM-III-R criteria should be applied to assess the diagnosis in surveys investigating the prevalence of insomnia. In accordance with other studies (Karacan et al. 1976, 1983, Bixler et al. 1979, Welstein et al. 1983, Mellinger et al. 1985), severe insomnia increased with age and females prevailed in all age groups. Nevertheless, this was true only for severe and partly for moderate insomnia and could not be found in mild insomnia.

As expected, patients with severe and moderate insomnia could be differentiated from patients with a mild or no sleep problem by means of sleep latency and sleep duration. While most patients with undisturbed sleep or mild insomnia reported sleep latencies of less than 30 min and a sleep duration of 6–8 h, patients with moderate/severe insomnia generally took more than 30 min to fall asleep and slept less than 6 h according to their subjective perception. Thus, a sleep latency of about 30 min and a sleep duration of about 6 h seem to be the "critical points" which differentiate good sleepers from insomniac patients according to their subjective perception.

Severe insomnia was significantly related to chronic somatic disorders. Impaired health status according to the patient at the time of second inquiry was significantly associated with the severity of insomnia, reflecting an association between chronic somatic health problems and impaired sleep.

Several groups have found a high comorbidity between insomnia and psychiatric disorders. Weyerer and Dilling (1991), as well as Ford et al. (1989), reported a significant association between psychiatric disorders, especially depression and anxiety disorders and moderate/severe insomnia. Two longitudinal studies demonstrated an association between insomnia and psychiatric disorders such as depression and anxiety (Angst et al. 1989, Vollrath et al. 1989, Ford et al. 1989). In line with these

results, we found a significant relation between moderate/severe insomnia and psychiatric disorders, while no association was found between mild insomnia and psychiatric problems.

It has to be said that in our study no operationalized diagnostic criteria for psychiatric disorders were applied. To compensate for this restriction in the present study, a subgroup of 105 severely insomniac patients was investigated by means of a structured clinical interview to assess a psychiatric diagnosis according to DMS-III-R. The results of this interview study confirmed the finding of a high comorbidity between insomnia and psychiatric disorders (Schramm E., Hohagen F., Käßpler C., Berger M., submitted). Nevertheless, the diagnosis of a psychiatric disorder additional to the diagnosis of insomnia by the physician is important for the evaluation of the treatment strategies chosen by the general practitioner. A significant association was found between the diagnosis of a psychiatric disorder and the treatment of insomnia with a prescribed hypnotic. Patients with the diagnosis of depression and insomnia were treated more often with benzodiazepines than with antidepressants although a sedating antidepressant would be the drug of choice for these patients. Bearing in mind the high comorbidity between severe insomnia and psychiatric disorders, the disturbed sleep might be the symptom of an underlying psychiatric problem for many patients which has to be considered in the treatment strategy to be chosen.

To investigate the course of insomnia a longitudinal study design was adopted. The results of our study indicate that insomnia in its severe form is a chronic health problem. The retrospective estimation of the majority of severely insomniac patients at the time of the first interview to have suffered from disturbed sleep for several years was confirmed by the 2-year follow-up of this patient group. Nearly half of them reported severe insomnia at all times of inquiry. Although the severity of the disorder may vary from severe to moderate insomnia, relatively few insomniac patients totally rid themselves of the sleep problem in the course of 4 months and about half of the patients still suffer from a serious sleep problem 2 years later. Females were more affected by severe insomnia compared to males during the whole time interval of the study.

One of the major topics of this study was to assess the use of hypnotics among patients with insomnia. Severely insomniac patients clearly used more prescribed hypnotics compared with patients who complained about mild or moderate insomnia. Nearly every fourth patient with severe insomnia reported a habitual use of prescribed hypnotics at the time of the first inquiry. The use of prescribed hypnotics increased with age and females took more sleeping pills compared with males. Benzodiazepines were by far the most frequently used hypnotics, prevailing clearly over other psychoactive drugs such as antidepressants, neuroleptics and others, according to the patient. The prescription rate of the general physician was lower compared with the hypnotic use reported by the patient. This may indicate that part of the prescribed hypnotics may come from a source other than the general practitioner. In accordance with the patient's

statement, the general practitioner prescribed mainly benzodiazepines to promote sleep.

Furthermore, comorbidity with a psychiatric disorder increased the prevalence of hypnotic use considerably in severely insomniac patients. Patients with a psychiatric disorder and the complaint of severe insomnia were treated mainly with a benzodiazepine hypnotic and not with a sedating antidepressant or another psychotherapeutic drug. In the literature, the use of prescribed hypnotics among respondents suffering from moderate/severe insomnia was lower compared with the findings reported by Weyerer and Dilling (1991), who found that 48.5% of the insomniacs with a moderate or severe sleep problem consumed hypnotics. The higher rate of hypnotic use in the Upper Bavarian Field Study (Weyerer and Dilling 1991) may be due to different assessment of sleep medication. While Weyerer and Dilling assessed the use of hypnotics during the past 7 days, in our study the use of hypnotics within 4 weeks prior to the interview was determined. Nevertheless, the use of hypnotics found by our study in general practice as well as in the community survey by Weyerer and Dilling (1991) is considerably higher compared with studies from the United States (Mellinger et al. 1985), where about 10% of the insomniac patients were using prescribed hypnotics. While Mellinger and co-workers described a generally conservative attitude towards medical treatment of insomnia in American society, with a short duration of regular hypnotic use, this does not seem to be the case in the German population.

The pattern of hypnotic use remained rather stable in the course of 2 years. Furthermore, most of the insomniac patients who were taking prescribed hypnotics reported retrospectively at T3 a daily use of hypnotics for an even longer period than the 2 years of the study. Bearing in mind that these hypnotics were mainly benzodiazepines, this pattern of use clearly contradicts the recommendation of sleep specialists concerning the use of these drugs (Consensus Conference 1984, Rütger et al., 1992, Hohagen et al., in press). While benzodiazepines should be given for a restricted period of time no longer than several weeks, these recommendations are obviously neglected in general practice. This finding is supported by another recent study in general practice which also demonstrated a predominantly long-term use of benzodiazepine hypnotics for several years (Geiselmann and Linden, 1991).

The longer duration of hypnotic intake contrasts with the effect on sleep quality according to the patient's subjective perception. At T3, just 22% of the severely insomniac patients reported that the sleep problem had improved considerably by taking the sleeping pill. About two-thirds of the patients with severe insomnia felt no or only little effect on insomnia by taking the prescribed hypnotic. Nevertheless, it cannot be ruled out that patients who were successfully treated with hypnotics dropped out during the 2-year study period and more patients with a poor outcome responded 2 years later. In this case the reports given by the severely insomniac patients at T3 would be confounded by their poor outcome. On the other hand, the question remains why the patients re-

porting low efficacy of prescribed sleep pills continue to take the hypnotics, although the majority does not seem to benefit from them. All of the patients had tried to reduce the dose or to discontinue the hypnotic, but more than 80% reported a worsening of night sleep after discontinuation. As most of the hypnotics were benzodiazepines, it has to be considered whether most insomniac patients continued taking hypnotics to avoid rebound insomnia, which can occur after discontinuation of benzodiazepines (Kales et al. 1983). Thus, the possibility cannot be excluded that the occurrence of rebound insomnia after benzodiazepine withdrawal may be one of the main factors, for chronic use of hypnotics.

Although insomnia is an important symptom of many somatic and psychiatric disorders, the general practitioner in more than half of the cases was not aware that the patient suffered from severe insomnia. Keeping in mind the high comorbidity of insomnia with psychiatric disorders, especially with depression (Ford et al. 1989, Angst et al. 1989, Vollrath et al. 1989, Weyerer and Dilling 1991), the question still remains open, whether primary care providers could decrease the incidence of new or recurrent affective disorders through their own therapeutic efforts or through appropriate referral to mental health specialists (Ford et al. 1989). The resolution of sleep disturbances was associated with decreased incidence of new psychiatric disorders in the longitudinal study by Ford and co-workers (1989). Early treatment intervention in recurrent depression shortened the overall length of the depressive episode considerably (Kupfer et al. 1989). In contrast to these findings, Vollrath et al. (1989) found no significantly higher incidence of depression or anxiety disorders in young insomniacs in a 2-year follow-up study compared with controls. Further prospective research on sleep disturbances in mental disorders under primary care is needed to clarify whether early differential diagnoses of insomnia and adequate treatment may prevent the morbidity and mortality associated with psychiatric disorders. Regardless of this, the general practitioner should make an adequate differential diagnosis to assess the cause of insomnia so as to choose an adequate treatment strategy. The fact that in most cases the general practitioner did not ask the patient about sleep disturbances underlines the importance of integrating knowledge of sleep disorders into training programs for medical students and general practitioners. A recent study confirmed that general physicians place inadequate emphasis on history-taking in the evaluation of insomnia and resort to the use of psychoactive drugs even when non-pharmacological approaches might be more effective (Everitt et al., 1990).

Weyerer and Dilling (1991) have commented that insomnia constitutes a major burden for the health care system, especially for the primary care physicians. They found a higher percentage of previous psychiatric treatment and a higher mean number of medical consultations among insomniac patients. In line with these results, severely insomniac patients displayed a higher mean number of medical consultations compared with good sleepers or patients with mild insomnia, reflecting the high relevance of insomnia for the health care system.

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