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Management and evolution of insomnia complaints among non-substance-misusers in a Swiss remand prison

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Summary

Questions under study: Insomnia is a frequent though rarely investigated problem among prisoners. The study's aim was to examine the clinical management of insomnia complaints in non-substance-misusing (NSM) prisoners (quality of medical consultation, effectiveness of drug prescription), and the risk of leaving prison with ongoing hypnotic prescription which might provoke withdrawal symptoms and encourage further hypnotic use outside prison.

Methods: Retrospective study of the medical records of 112 NSM prisoners complaining of insomnia at medical consultation over a one year period at the outpatient-service of the Champ-Dollon remand prison (Geneva, Switzerland). We examined insomnia management by the general practitioners (anamnestic and clinical evaluation documented in the record), type, duration and effectiveness of treatment.

Results: The 112 records show a prescription of hypnotics to 111 patients (80% benzodiazepines or Zolpidem), a limited documented insomnia work-up (anamnestic information about sleep habits, sleep latency and previous hypnotic use for less than a third of the patients, about the impact of insomnia, such as fatigue, on daily activity in only 7%). In more than 60% of the patients, insomnia complaints persisted for more than 3 weeks. In 41 (37%) patients, improvement (defined subjectively based on patients' complaints) was complete, in 20 (18%) absent, and in 34 (30%) incomplete while taking the prescribed hypnotics. Patients without or with only partial improvement of insomnia received the highest number of hypnotics (mean 2.4, vs. 1.4 for patients with total improvement, 95% CI of the difference: 0.7–1.4). 55% of the 112 prisoners left prison with hypnotics still being prescribed.

Conclusions: Our results show that prison physicians' evaluation for insomnia was incomplete. Drug prescription did not seem to have been an effective treatment for insomnia complaints in a sizeable number of patients. Many prisoners leave the prison with benzodiazepine prescription still ongoing and could be at risk for continued hypnotic use following imprisonment.

Key words: insomnia; prison; primary care; drug prescription

Introduction

Insomnia is a frequent complaint of substance misusing patients during the withdrawal period after imprisonment [1–3]. Our previous study [4] showed, however, that not only substance misusers, but also 25.8% of all non-substance-misusing (NSM) male remanded prisoners younger than 39 years seen on consultation during the study period of three weeks received hypnotic treatment. We are not aware of any study on insomnia in NSM prisoners.

The aim of our present study was to examine the clinical management, treatment and course of insomnia in prisoners not known to be substance misusers who were seen on consultation by general practitioners at the outpatient service at the remand prison in Geneva, Switzerland.

The data were collected in order to assess the following four general questions: I. Does treatment follow published recommendations? II. Does treatment differ between various patient subgroups? III. Does improvement differ between the patient subgroups? IV. Is treatment appropriate at the moment of departure from prison?

The general questions were evaluated in the following detailed way:

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I. Does treatment follow published recommendations?

(1) Do physicians evaluate the complaint "insomnia" in line with current recommendations for insomnia management [5–8]? These suggest taking a history from patients especially regarding previous insomnia and use of hypnotics, daytime consequences of insomnia (fatigue etc.), times of going to bed and waking times, nature of the sleep problem (falling vs staying asleep), and possible causes of insomnia (environment, psychological problems, sleep-wake cycle, substance use).

(2) Which type of drugs were prescribed for which duration? Since effectiveness of long term use of most pharmacological treatment has not been proven, most guidelines recommend to limit the use of hypnotics to several weeks.

II. Does treatment differ between various patient subgroups?

(3)Which are factors that are associated with the type of prescription, e.g. is the type of hypnotic prescribed different for chronic vs. transitory insomnia (<3 weeks [9])? Does the type of treatment vary according to whether the patient desires pharmacological treatment, whether the patient receives antidepressant or neuroleptic treatment, whether the patient has a psychiatric history, is confined to longer imprisonment, and manifests improvement of insomnia? Do patients treated with several benzodiazepines differ from those receiving one benzodiazepine or another type of hypnotics as regards the frequency of consultations, of psychological problems and the need for psychological follow up?

III. Does improvement differ between the patient subgroups?

(4) Which is the overall percentage of patients that report improvement of insomnia? Are the hypnotics different for those patients showing improvement (defined subjectively based on patients' complaints) than for those patients without or with only partial improvement? Our experience is that a substantial number of patients complain that chloral hydrate insufficiently relieves insomnia. Some physicians prescribe chloral hydrate in order to avoid substances that are supposed to have a greater risk of inducing dependency, in particular benzodiazepines.

(5) Which are factors associated with improvement, eg, does a higher percentage of patients reporting improvement receive psychological help (follow up by a psychologist or, rarely, a psychiatrist)? Is duration and subjective improvement of insomnia associated with the prescription of a particular type of hypnotic or sociodemographic variables and factors known to be associated with insomnia (gender, age, mood disorders or history of psychiatric or somatic illness [9, 10]), ie, do more patients without or with only partial improvement than patients with improvement have psychological problems, a history of psychiatric or somatic illness and a longer duration of insomnia, all factors that we suspected from the literature and our experience to be positively related to the severity of insomnia? We postulated that among NSM patients complaints of transitory insomnia (<3 weeks [9]) upon arrival at the prison are predominant because of environmental factors and internal factors such as increased anxiety at the beginning of imprisonment, and that improvement would therefore be related more to psychological factors and duration of imprisonment than to the prescription of hypnotics. We thought that insomnia complaints in patients with multiple and longer imprisonment would improve in a higher percentage of patients or more rapidly than in patients with only one imprisonment, because the former patients already know the prison environment and would more easily adapt to it.

IV. Is treatment appropriate at the moment of departure from prison?

(6) Do prisoner patients leave prison with hypnotics still prescribed which might provoke withdrawal symptoms and encourage further hypnotic use outside prison [11]? Does a greater percentage of patients receiving several as compared to no or only one benzodiazepine leave prison with hypnotics still prescribed?

Patients and methods

Study design

Champ-Dollon is the remand prison in the Canton of Geneva, Switzerland, and has space for 300 to 400 prisoners. The prison administration noted about 2500 new entries of prisoners from October 1997 to September 1998 (2465 in 1997, and 2695 in 1998). The medical service works as an outpatient primary care clinic, comprising at the time of the study nurses, psychologists, one psychiatrist and two medical residents in general medicine, who were supervised by a senior physician. Consultations by a surgeon, ophthalmologist and an ENT-specialist were provided once a month. During the study year, five medical residents (four men and one woman) had done rotations of several months as general practitioners in the prison outpatient clinic. All of them and the senior physician had several years' experience in clinical medicine, most of them at the University Hospital of Geneva. All but one were specialising in general or general internal medicine. For most of them, the rotation at the prison was an integral part of their medical residency at the Medical Polyclinic of the University Hospital at Geneva. They did not differ in age or previous experience from average medical residents trained in general practice in the Canton of Geneva.

At entry to prison, all prisoners are seen briefly by a nurse, in order to evaluate whether urgent medical con-

sultation is necessary. Insomnia in a NSM patient is not routinely considered a reason for urgent medical consultation. Nurses are authorised to distribute a limited number of hypnotics on a maximum of three consecutive days to prisoners complaining of insomnia. In addition to urgent consultation at entry, every prisoner who wishes is seen on consultation on a voluntary scheduled basis, after his/her written request.

Algorithm for defining the study population

During the academic year 1997/98, after each consultation the general practitioners noted the main complaints of the patient, the diagnosis and treatment prescribed on a questionnaire (in the following called questionnaire A, see [12] where details of the method have been described). The general practitioners returned completed questionnaires for 2772 consultations concerning 995 patients. This suggests a response rate of around 90% given an estimated 3000 consultations on average per year, according to prison statistics collected independently of this study.

All insomnia patients identified by questionnaire A during the study year were included in the study, if neither questionnaire A nor all information contained in their medical record indicated any substance misuse (see the definitions used for the study of the records in the section: variables measured [questionnaire B]):

Variables (questionnaire A)

- Number of consultations: this indicates now many times a patient consulted (number of questionnaires A) during the academic year 1997/1998. If one patient consulted more than once during the study year, all information on the consecutive questionnaires A was considered, and any one consultation or diagnosis or treatment for insomnia or substance misuse was considered sufficient for inclusion (insomnia) or exclusion (substance misuse) of the patient.
- Substance misuse according to questionnaire A means that during the year 1997/1998 a patient either consulted at least once for a drug- or alcohol-related problem, was diagnosed as presenting with drug or alcohol misuse, or received any specific treatment such as methadone or treatment for alcohol withdrawal.
- Insomnia according to questionnaire A means that during the year 1997/1998 a patient either asked at least once for medical consultation because of a main complaint of "insomnia", or "insomnia" was diagnosed and/or treated during a consultation for other main complaints.

Process of defining the study population

- According to the information reported on questionnaire A, 176 of the 995 patients asked for medical consultation because of "insomnia" and for 77 others, "insomnia" was diagnosed and/or treated.
- Among these 253 insomnia patients, 104 were excluded because according to questionnaire A they had a substance misuse related problem.
- We retrospectively studied the medical records of 147 (two records could not be found) of the remaining 149 insomnia patients who, according to questionnaire A, were *not* substance misusers.
- Of the 147 records, a further 35 were excluded, as they showed that patients fulfilled our criteria for substance misuse described below (section: variables measured [questionnaire B]). These patients had for example ongoing treatments (eg, methadone) that had not been re-evaluated during a medical consultation, or they belonged to the minority of patients for whom the physicians omitted to report the consultation using questionnaire A.
- Therefore, 112 insomniac patients were left, who where not known to be substance misusers. Data were collected from their medical records according to a different questionnaire (questionnaire B) containing the elements shown in the tables and defined in the following section.

Variables measured (questionnaire B)

The patient's record used for questionnaire B consisted of physicians', nurses', psychologists' and psychiatrists' notes about all consultations they provided in our prison outpatient service, an order sheet on which all medications prescribed in prison and their doses and duration were noted and signed by the prescribing physician, another sheet on which nurses documented the distribution of medication, and all letters written by the prisoner: in order to be seen on consultation by the medical service, prisoners need to make a written request; all these letters are kept in the medical record. In these letter patients describe in general – more or less detailed – their problem(s). The record sometimes contained copies of laboratory tests, x-ray reports, reports from other prisons or hospitals, or information obtained with the consent of the prisoner from his/her previous treating physicians.

In questionnaire B we used the following definitions:

- Number of hypnotics, antidepressant treatment, neuroleptic treatment: this refers to the medications prescribed by a physician on the medical order sheets. Classes of drugs (antidepressants, neuroleptics, BDZ hypnotics etc.) were defined according to the WHO classification of 1997.
- Days in prison (ie, length of imprisonment), expulsion, multiple imprisonment: the medical records contain the date when a prisoner entered and left prison and whether he/she was expelled (deportation), transferred to another prison or freed. A new record is established at each re-entry of the prisoner. This new record is attached on top of the previous record.
- Psychiatric history was defined as any reference to a psychiatric problem before the prison stay that figured in the record.
- A psychological problem was defined as any psychiatric or psychological symptom or diagnosis during imprisonment noted by general practitioners, psychologists or psychiatrists in the record. Psychological problems were mostly described as "depression" or "anxiety". The diagnosis is based on the clinical evaluation by physicians and psychologists working at the prison outpatient clinic. The use of psychometric instruments (eg, Hamilton scales) has been rarely noted in the records.
- Follow up (psychologist/psychiatrist): the patient has had at least one consultation by a psychologist (rarely by a psychiatrist).
- Transitory/chronic insomnia: According to Kupfer and Reynolds [9], we distinguished transient (<3 weeks) insomnia from chronic forms of insomnia (>3 weeks) based on the duration of the complaint.
- Dose increased: Refers to hypnotics and was evaluated as 0 if during imprisonment the dose of the hypnotic was stable or had been decreased. Increase in dose or supplementation by a second hypnotic was considered as "increased dose".
- Patient desired hypnotic: Evaluated as "1" if the patient asked explicitly in one of his/her letters for a hypnotic medication or if the physician/nurse noted in the record that the patient desired a hypnotic medication. All other cases are evaluated as "0" (indicating absence of documented explicit request for hypnotic medication). Even if this variable might miss

some explicit requests it reflects adequately whether the physician has been placed under "pressure" (written request) or has felt under pressure (note in the record) to prescribe medication as opposed to alternative forms of insomnia treatment.

– History of somatic illness was defined as medical or surgical problems having occurred during the lifetime of the patient before imprisonment that the general practitioners considered serious enough to be noted in the record.
– Substance misuse: We have chosen relatively wide criteria of definition of substance misusers because the aim was to exclude doubtful cases in order to make sure that in our sample of non-substance-misusers we included only patients whose insomnia problem could not possibly be due to the withdrawal of a substance. Illicit drug misusers were defined as at least occasional users of cocaine or heroine or regular users of cannabis. Patients were considered to have a problem of alcohol abuse if the reason for consultation or the diagnosis was an alcohol related disorder or if the record contained evidence in the history for alcohol dependence or alcohol misuse (defined according to DSM-IV criteria) or anamnestic evidence for heavy consumption (more than 3/4 litre of wine/day or its equivalent). Benzodiazepine misuse was defined as the daily intake of benzodiazepines for several months.
– Improvement of insomnia was defined in the following way: Improvement was considered as complete if according to physicians' or nurses' written notes or the letters of prisoners insomnia disappeared with treatment or if the patient told the physician that he/she had stopped treatment and no longer suffered from insomnia. Improvement was considered as absent if patients continued to complain of insomnia, for example if they explained in their letters that the treatment had had no effect, or if the absence of subjective improvement was noted by nurses or physicians. Improvement was considered as partial if the patient described some improvement, but asked for further insomnia consultation or if letters or notes specified improvement as partial, small or some improvement. If no note or letter was found that permitted drawing conclusions about the degree or absence of improvement of insomnia, the case was classified as unknown. In prisoners with more than one term at Champ Dollon, we considered that they had experienced complete improvement, if at least once during their imprisonment they had experienced complete improvement after the treatment. We considered improvement as partial if no complete improvement of insomnia was noted during the different episodes of insomnia, but at least once partial improvement was described. Only a minority of prisoners had multiple episodes of insomnia and only a minority had multiple prison stays, the majority of them two.

Statistical analysis was performed using SPSS. We compared subgroups of patients according to the type of hypnotics they received, the degree of improvement of insomnia, and according to whether they were still taking hypnotics when leaving prison. Chi-squared tests were used for dichotomous variables; one way ANOVA and student t-test (independent variables) were used for continuous variables with normal distribution and non-parametric tests (Kruskal-Wallis and Mann-Whitney for independent variables) were used for continuous variables with not normal distribution (number of consultations, hypnotics, days in prison). Binary logistic linear regression was used to determine which variables predict the prescription of BDZ or improvement of insomnia. Variables entered were those supposed from our experience and the literature to influence the dependent variables mentioned.

The procedures followed were in accordance with the ethical standards of the responsible institutional committee on human experimentation and with the Helsinki declaration. The study was approved by the ethics committee for research in public health of the University of Geneva.

Results

The results obtained from the records of the 112 NSM insomnia patients are shown in table 1. Any reference from now on to insomnia patients is supposed to mean *non-substance-misusing* (NSM) insomnia patients. The mean age of patients was 30.9 ± 9.7 years. Among these 112 patients, nationality (Swiss, other Europeans, African, other continents) was not associated with any statistical difference at the 5% level between variables, except for expulsion (no expulsion for Swiss), psychological problems [10 (90.9%) of the 11 Swiss, 23 (53.5%) of the 43 other Europeans, 22 (68.8%) of the 32 Africans, and 19 (82.6%) of the 23 patients from Asia and North or South America; p = 0.03] and prescription of hypnotics more than 3 months (to 54.5% of the Swiss, 13.6% of the other European, 46.9% of the African and 41.7% of the American or Asian patients). Sex was not associated with any statistical difference between variables at the 5% level, except for antidepressant therapy, which was more often prescribed to women (to 27.3% of the 11 women, but only 6.9% of the 101 men prisoner patients, p = 0.004).

As already reported elsewhere [12], 14 (12.5%) of the 112 patients had a history of psychiatric inpatient or outpatient treatment anytime prior to entering prison, and in 88 (78.6%) patients a history of somatic illness or surgical treatment anytime before imprisonment that the general practitioners considered important enough to be noted in the record (most patients suffered from osteoarticular or gastric pain, 3 patients from diabetes, two from asthma, two from tuberculosis, one each from epilepsy and HIV).

In the majority of the 112 patients, insomnia persisted for more than 3 weeks. 78 (69.6%) patients suffered from a single episode of insomnia and in 14 (12.5%) of these 78 patients, insomnia complaints persisted during the entire length of imprisonment. 33 patients suffered from several episodes of insomnia, ie, after a period of no insomnia they complained again of sleep problems.

(1) The records of the 112 insomniac patients show a limited documented insomnia work-up containing enquiries about sleep habits, sleep latency and previous hypnotic use for less than

Table 1

Characteristics of the 112 (101 men and 11 women) non-substance-misusing prisoners who complained of or have been treated for insomnia, patterns of insomnia and use of hypnotics.

			number of patients (%) N (total) = 112
Days in prison (i.e. length of imprisonment)[a]*:*			
<3 weeks / 3 weeks-3 months / >6 months			14 (12.5%) / 47 (42.0%) / 51 (45.5%)
Length of stay in prison at first prescription of hypnotic[b]*:*		1–7 days	41 (37.3%)
		8–14 days	26 (23.6%)
		15–30 days	21 (19.1%)
		31–180 days	22 (20.0%)
Patient desired hypnotic:			
Yes[c]			64 (57.1%)
No (hypnotic proposed by physician)			45 (40.2%)
Not clear (patient desired "something"/"a solution")			3 (2.7%)
Hypnotic prescription:			
<3 weeks / 3 weeks–3 months / >3 months			44 (39.3%) / 31 (27.7%) / 37 (33.0%)
Type of hypnotic[d]*:*			
Herbal preparation (tea or tablets) only			15 (13.6%)
Zolpidem only			17 (15.1%)
Chloral hydrate only			6 (5.4%)
Benzodiazepine only			12 (10.7%)
More than one substance:[e]			61 (54.5%)
Length of prescription of particular hypnotics			
BDZ or Zolpidem (n = 81)	<3 weeks		23 (28.4% of 81)
	>3 weeks (max. 17 weeks)		31 (38.3% of 81)
	Non stop[f]		27 (33.3% of 81)
Chloral hydrate (n = 29)	<3 weeks		8 (27.6% of 29)
	>3 weeks (max. 17 weeks)		8 (27.5% of 29)
	Non stop[f]		13 (44.8% of 29)
Herbal(tea/tablets, n = 32)	<3 weeks		23 (71.9% of 32)
	>3 weeks (max. 17 weeks)		5 (15.6% of 32)
	Non stop[f]		4 (12.5% of 32)
Dose of hypnotic increased consecutively:		No	91 (81.3%)
		Yes	21 (18.8%)
Hypnotic still prescribed when leaving prison:		No	48 (42.9%)[g]
		Yes	62 (55.3%)[g]
BDZ or Zolpidem			50 (44.6%)
Chloral hydrate			11 (9.8%)
Herbal preparation			1 (0.9%)
Type of insomnia (according to the duration of the complaint):			
Transitory (<3 weeks)			32 (32.7%)
Chronic (>3 weeks)[h]			66 (67.3%)
Number of episodes of insomnia:	Single (all)		78 (69.6%)
		Continuous[i]	14 (12.5%)
		Not continuous	64 (57.1%)
	2		21 (19.6%)
	3, 4 or 5		12 (10.7%)
Causes of insomnia complaints:			
Not mentioned or not known			32 (28.6%)
Any form of anxiety and/or depression			62 (55.4%)
"Incarceration" or factors of incarceration (isolation cell, heat, not enough sports)			12 (10.7%)
Somatic disease (3× pain, 1× influenza, 1x heart insufficiency, 1× obesity)			6 (5.4%)
Psychological (psychiatric) problem noted in record:			
No psychological/psychiatric problem			35 (31.3%)
Problems related to anxiety or depression			66 (58.9%)
Other or not clear			11 (9.8%)

Table 1 (cont.)

		number of patients (%) N (total) = 112
Anamnestic data noted in record:		
Time of going to bed or sleeping		33 (29.5%)
Whether problem of falling asleep or of staying asleep		25 (22.3%)
Whether fatigue during day		8 (7.1%)
Whether patient already taken hypnotics		21 (18.8%)
History of hypnotic use		7 (of 21 questioned)
Cause of insomnia		79 (70.5%)
Insomnia discussed at follow up consultation:	Yes	65 (58.0%)
	No	47 (41.9%)
Improvement of insomnia:		
No improvement		20 (17.9%)
Partial improvement with treatment		34 (30.4%)
Complete improvement of Insomnia (treatment continued or not)		41 (36.6%)
Not known		17 (15.2%)

[a] according to medical record until 1999, summary of one or multiple imprisonments
[b] unclear for 2 patients
[c] in the letter to the physician
[d] 111 of the 112 insomniac patients received a prescription of at least one hypnotic.
[e] either consecutively or at the same time
[f] during the duration of imprisonment
[g] for two patients data not clear whether hypnotics still prescribed when leaving prison
[h] For 14 patients the exact length of insomnia is not clear because of lack of follow up in the record or because they left prison <3 weeks after beginning of insomnia. If more than one episode of insomnia: sum of the length of all episodes.
[i] all the time during prison stay

Table 2a
Comparison of characteristics, cofactors and evolution of patients receiving a particular type of hypnotic[a] among the 112 non-substance-misusing insomnia patients (%).

N (%) or median (percentiles 25 and 75) of 112	No BDZ[b]	One BDZ[b]	Two BDZ[b]	p[c]	Odds ratio (95% CI) with length of imprisonment (LI) as covariate (binary logistic regression 2 BDZ vs. 0–1 BDZ)[d]	p-value for the variable with covariate LI
1. Characteristics/Cofactors	**n = 46**	**n = 37**	**n = 29**			
N of consultations (shown consultation >1)	28 (60.9)	27 (73.0)	26 (89.7)	0.003	1.1 (0.9–1.3)	0.5
N of hypnotics (shown hypnotics >1)	7 (15.2)	25 (67.6)	29 (100.0)	<0.001	9.7 (3.9–23.6)	<0.001
Days in prison (median, P25–P75)	63 (30–124)	81 (40–180)	200 (71–345)	0.003	1.0 (1.0–1.0)	0.007
Multiple (>1) imprisonment	9 (19.6)	6 (16.2)	13 (44.8)	0.02	3.5 (1.3–9.2)	0.01
Psychiatric history or problem	25 (54.3)	24 (64.9)	27 (93.1)	0.002	6.6 (1.4–30.5)	0.02
Follow up (psychologist)	8 (17.4)	8 (21.6)	16 (55.2)	0.001	3.2 (1.2–8.7)	0.2
Hypnotic prescription length						
<3 weeks / 3 weeks-3 months / >3 months (%)	70 / 22 / 9	24 / 38 / 38	10 / 24 / 66	<0.001	4.5 (1.7–12.3) binary: >3 months = 1	0.003
Type insomnia: transitory / chronic (% chronic) (type not known for 14 patients)	24 / 13 (35.1)	6 / 27 (81.8)	2 / 26 (92.9)	<0.001	7.1 (1.5–33.4)	0.01
Dose increased	1 (2.2)	7 (18.9)	13 (44.8)	<0.001	5.4 (1.8–16.2)	0.003
Patient desired hypnotic	19 (41.3)	24 (64.9)	21 (72.4)	0.02	2.2 (0.8–5.9)	0.1
Antidepressant treatment	1 (2.2)	1 (2.7)	8 (27.6)	<0.001	9.7 (1.7–54.1)	0.009
Neuroleptic treatment	2 (4.3)	2 (5.4)	8 (27.6)	0.003	4.3 (1.0–18.0)	0.04
2. Evolution						
Follow up visit for insomnia	14 (30.4)	25 (67.6)	26 (89.7)	<0.001	7.7 (2.1–28.2)	0.002
Improvement no / partial / complete (%) (improvement not known for 17 patients)	6 / 21 / 74	28 / 38 / 34	31 / 52 / 17	<0.001	0.4 (0.2–0.7) 0 = no improvement	0.004
Hypnotic when leaving prison	15 (32.6)	14 (37.8)	21 (77.8)	0.004	6.0 (1.8–19.6)	0.003

[a] patients can receive several hypnotics either consecutively or together at the same time;
[b] patients receiving no vs. one vs. two BDZ simultaneously
[c] Chi-squared test for dichotomous and trichotomous variables; Kruskal-Wallis for independent samples for continuous variables (number of consultations, number of hypnotics, days in prison). The groups compared did not differ significantly (p >0.05) in age, sex, nationality, imprisonment less than 3 weeks, number of days between incarceration day and first insomnia consultation, and prescription of analgesic treatment.
[d] Binary logistic regression 0 BDZ versus 1–2 BDZ, as well as using gender, age and nationality as additional cofactors obtained very similar results.

a third of the 112 patients, and about impact of insomnia, such as fatigue, on daily activity in only 7.1%. We did not find any significant differences between the different physicians concerning the insomnia work-up (data not shown).

(2) The records of the 112 insomniac patients show a prescription of hypnotics to 111 patients (80% benzodiazepines or Zolpidem). 32 (28.6%) patients were referred to a prison psychologist or psychiatrist for follow up. 57.1% of the 112 patients asked explicitly for the prescription of a hypnotic drug. Hypnotics were prescribed for more than three weeks in 60.7% of the patients. A small percentage of patients received only hypnotic prescriptions of tablets or tea on a herbal basis (13.6%). A similar proportion of patients received only Zolpidem (15.1%). The majority of patients received either more than one substance (54.5%) or a treatment that consisted of Benzodiazepines only (10.7%) or chloral hydrate only (5.4%). In 18.8% of patients, the dose of the hypnotics was consecutively increased. The duration of the prescription of different hypnotics is shown in table 1. The majority of herbal treatments lasted less than 3 seeks, whereas the majority of all other substances were prescribed for more than 3 weeks (only less than a third for less than 3 weeks).

(3) Results concerning the association between the types of hypnotics prescribed to the 112 patients and characteristics are shown in table 2. Regression analysis shows that the number of BDZ and the total number of hypnotics prescribed is related to the length of prison stay. To control for this influence, length of prison stay was used as a covariate in the analyses shown in table 2. The type of hypnotic prescribed differed significantly according to whether patients suffered from transitory versus chronic insomnia: only 7% of patients receiving 2 BDZ suffered from transitory insomnia, compared to the majority of patients receiving treatment other than with BDZ. We found a linear association between the number

Table 2b
Comparison of characteristics, cofactors and evolution of patients receiving a particular type of hypnotic[a] among the 112 non-substance-misusing insomnia patients (%).

N (%) or median (percentiles 25 and 75) of 112	A: Herbal treatment and / or Zolpidem	B: one or two BDZ with or without A	C: Chloral hydrate with or without A or B	p[b]	Odds ratio (95% CI) with length of im-prisonment (LI) as covariate (binary logistic regression [c]		p-value for the variable with covariate LI	
1. Characteristics/Cofactors:	**n = 37**	**n = 46**	**n = 29**		**A vs. B and C**	**A and B vs. C**	**Avs.B/C**	**A/B vs. C**
N of consultations (shown consultation >1)	21 (56.8)	35 (76.1)	25 (86.2)	0.01	1.2 (1.0–1.5)	1.0 (0.9–1.2)	0.05	0.8
N of hypnotics (shown hypnotics >1)	4 (10.8)	34 (73.9)	23 (79.3)	<0.001	16.4 (5.3–53.4)	2.4 (1.4–4.0)	<0.001	0.001
Days in prison (median, P25–P75)	75 (32–150)	127(35–255)	81(50–167)	0.25	1.0 (1.0–1.0)	1.0 (1.0–1.0)	0.13	0.6
Multiple (>1) imprisonment	8 (21.6)	13 (28.3)	7 (24.1)	0.8	1.1 (0.4–3.0)	0.9 (0.3–2.5)	0.8	0.9
Psychiatric history or problem	19 (51.4)	37 (80.4)	20 (69)	0.02	2.6 (1.1–6.1)	1.0 (0.4–2.6)	0.03	1.0
Follow up (psychologist)	7 (18.9)	18 (39.1)	7 (24.1)	0.1	1.6 (0.6–4.5)	0.6 (0.2–1.8)	0.4	0.4
Hypnotic prescription length					binary: >3 months = 1			
<3 weeks / 3 weeks-3 months / >3 months (%)	76/19/5	26/28/46	14/38/48	<0.001	6.4 (3.0–14.0)	2.6 (1.0–6.8)	0.001	0.04
Type insomnia: transitory / chronic (% chronic) (type not known for 14 patients)	20 / 8 (28.6)	8 / 33 (80.5)	4 / 25 (86.2)	<0.001	11.6 (4.0–34.0)	4.5 (1.4–14.7)	<0.001	0.01
Dose increased	0 (–)	10 (21.7)	11 (37.9)	<0.001	5511 (0.0–8.9E+21)	5.1 (1.7–14.9)	0.7	0.003
Patient desired hypnotic	12 (32.4)	30 (65.2)	22 (75.9)	0.001	4.6 (1.6–10.9)	3.0 (1.2–7.9)	<0.001	0.02
Antidepressant treatment	1 (2.7)	7 (15.2)	2 (6.9)	0.1	3.3 (0.4–28.9)	0.5 (0.1–3.3)	0.3	0.5
Neuroleptic treatment	0 (–)	8 (17.4)	4 (13.8)	0.03	1473 (0.0–3.5E+17)	1.4 (0.3–5.9)	0.7	0.6
2. Evolution:								
Follow up visit for insomnia	8 (21.6)	33 (71.7)	24 (82.8)	<0.001	10.8 (4.1–28.4)	5.0 (1.7–14.7)	<0.001	0.003
Improvement no / partial / complete (%) (improvement not known for 17 patients)	0 / 15 / 85	20 / 44 / 37	43 / 43 / 14	<0.001	0.1 (0.03–0.3) 0 = no improvement	0.3 (0.1–0.5)	<0.001	<0.001
Hypnotic when leaving prison	15 (40.5)	27 (60.0)	20 (71.4)	0.04	3.0 (1.3–7.0)	2.3 (0.9–6.0)	0.009	0.07

[a] patients can receive several hypnotics either consecutively or together at the same time;
[b] Chi-squared test for dichotomous and trichotomous variables; Kruskal-Wallis for independent samples for continuous variables (number of consultations, number of hypnotics, days in prison). The groups compared did not differ significantly (p >0.05) in age, sex, nationality, imprisonment less than 3 weeks, number of days between incarceration day and first insomnia consultation, and prescription of analgesic treatment.
[e] Binary logistic regression using gender, age and nationality as additional cofactors obtained very similar results.

of BDZ prescribed simultaneously and the following factors: the number of BDZ prescribed simultaneously was positively associated with multiple imprisonment, a history of psychiatric disease and/or psychological problems, longer duration of hypnotic prescription, chronic insomnia, increased dose of hypnotic treatment, prescription of antidepressants and of neuroleptics, and follow up by a psychologist or psychiatrist. The number of BDZ prescribed simultaneously was inversely associated with transitory insomnia and improvement of insomnia. Similar associations were found between the cited characteristics and a prescription of chloral hydrate, whereas characteristics of patients treated with Zolpidem or herbal treatment were similar to those of patient treated with one or no BDZ (table 2).

Patients who received 2 BDZ simultaneously had more medical consultations and stayed longer in prison than patients with one or no BDZ (mean number of consultations 4.8 vs. 3.9 vs. 2.7, p = 0.003, median days in prison 200 vs. 81 vs. 63, p = 0.003, table 2). Using length of prison stay(s) as covariate showed that the variables "number of consultations" and "follow up by a psychologist" might be principally related to the length of imprisonment.

Regression (table 3) shows that the variable "treatment with BDZ" was predicted by the existence of chronic insomnia (>3 weeks), and the fact that the patient desires a hypnotic.

(4) In 41 (36.6%) patients, improvement was complete, in 20 (17.9%) patients subjective improvement of insomnia was absent and in 34 (30.4%) partial while taking the prescribed hypnotics. Patients without or with only partial improvement of insomnia received the greatest number of hypnotics (mean 2.4, p <0.001).

Among the 51 insomnia patients, who stayed

Table 3

Binary logistic regression of the dependent variable: treated with benzodiazepines (n = 66) vs. not treated with benzodiazepines (n = 46).

Model	Variables[a] and covariates[b] entered	Patient number	B	p-value	Odds ratio	95% CI for odds ratio
1	type of insomnia (chronic insomnia = 1)	98	+ 2.5	<0.001	12.2	4.5–33.4
	length of imprisonment (days)		<0.01	0.3	1.0	1.0–1.0
	age (years)		+0.01	0.6	1.0	1.0–1.1
	gender (m = 1)		+1.2	0.3	3.2	0.4–23.7
	Swiss		+1.6	0.2	4.8	0.5–42.9
	European		+0.3	0.7	1.3	0.3–5.1
	African		+0.02	1.0	1.0	0.2–4.3
2	patient desires hypnotic	112	+1.1	0.005	2.9	1.3–6.7
	length of imprisonment (days)		<0.01	0.03	1.0	1.0–1.0
	age (years)		+0.03	0.2	1.0	1.0–1.1
	gender (m = 1)		+0.5	0.5	1.6	0.3–7.9
	Swiss		+1.5	0.1	4.3	0.7–28.3
	European		–0.12	0.8	0.9	0.3–2.7
	African		0.00	1.0	1.0	0.3–3.3
3	type of insomnia (chronic insomnia = 1)	98	+2.4	<0.001	12.8	4.0–40.9
	psychological history or problem		+1.1	0.08	2.9	0.9–9.2
	length of imprisonment (days)		<0.01	0.5	1.0	1.0–1.0
	age (years)		+0.02	0.4	1.0	1.0–1.1
	gender (m = 1)		+0.9	0.4	2.5	0.3–19.8
	Swiss		+1.4	0.2	4.2	0.5–37.0
	European		+0.6	0.4	1.9	0.4–8.1
	African		+0.2	0.8	1.2	0.3–5.5
4	patient desires hypnotic	112	+1.1	0.01	3.1	1.3–7.4
	psychological history or problem		+0.9	0.06	2.5	0.95–6.4
	length of imprisonment (days)		<0.01	0.09	1.0	1.0–1.0
	age (years)		+0.02	0.12	1.0	1.0–1.1
	gender (m = 1)		+0.9	0.63	1.5	0.3–7.5
	Swiss		+1.4	0.2	4.0	0.6–26.8
	European		+0.6	0.9	1.1	0.3– 3.5
	African		+0.2	0.8	1.2	0.3–4.2

[a] Variables entered were those supposed from our experience and the literature to influence treatment: psychological history or problem, multiple incarceration, patient desires hypnotic and type of insomnia. All were significant except multiple incarceration (data of this variable are not shown)

[b] multivariate analysis: as covariates always used were length of imprisonment, age, gender and nationality (categorical: Swiss, European, African versus other).

Table 4

Comparison of the characteristics of patients with no improvement vs. partial improvement vs. complete improvement of insomnia among the 95 non-substance-misusing insomnia patients for which data on improvement have been found[a].

Characteristics N (%) of 95 or median (percentiles 25 and 75) of 112	No improvement n = 20	Partial improvement n = 34	Complete improvement n = 41	P[b]
N of consultations (shown consultation >1)	16 (80.0%)	32 (94.1%)	28 (68.3%)	0.002
N of hypnotics (shown hypnotics >1)	18 (90%)	29 (85.3%)	11 (26.8%)	<0.001
Days in prison (median, P25–P75)	66 (37–175)	152 (90–337)	75 (40–205)	0.002
Psychiatric history or problem	14 (70.0%)	30 (88.2%)	21 (51.2%)	0.003
Hypnotic prescription length: <3 weeks / 3 weeks-3 months / >3 months (% rounded)	5% / 55% / 40%	9% / 21% / 71%	66% / 24% / 10%	<0.001
History of medical or surgical illness	14 (70.0%)	32 (94.1%)	32 (78.0%)	0.05
Type insomnia: transitory / chronic (% chronic) (type not known for 11 of the 95 patients)	1 / 19 (95.0%)	1 / 31 (96.9%)	19 / 13 (40.6%)	<0.001
Dose increased	8 (40.0%)	12 (35.3%)	1 (2.4%)	<0.001
Antidepressant treatment	2 (10.0%)	7 (20.6%)	0 (–)	0.01
Neuroleptic treatment	5 (25.0%)	6 (17.6%)	1 (2.4%)	0.02
Follow up (psychologist)	5 (25.0%)	17 (50.0%)	8 (19.5%)	0.01
Treated with BDZ tranquilliser	10 (50.0%)	17 (50.0%)	9 (22.0%)	.02
N of BDZ (% of patients receiving 0/1/2 BDZ)	10% / 45% / 45%	21% / 35% / 44%	61% / 27% / 12%	<0.001
Treated with chloral hydrate	12 (60.0%)	12 (35.3%)	4 (9.8%)	<0.001
Hypnotic when leaving prison	18 (90.0%)	19 (59.4%)	12 (29.3%)	<0.001

[a] for 17 (15%) of the 112 patients, no information could be found about improvement. Of these 17 patients, 6 continued treatment without any information in the record whether insomnia improved or not, and 11 patients left prison 0 to 7 days after the prescription of hypnotics, without further contact with the outpatient service.

[b] chi-squared for dichotomous and trichotomous variables; Kruskal-Wallis for independent samples for continuous variables (number of consultations, number of hypnotics, days in prison). The groups did not differ significantly ($p > 0.05$) in age, sex, origin (continent), Swiss nationality, multiple (>1) imprisonment, the fact whether the patient asked for hypnotic prescription, number of days between incarceration day and first insomnia consultation, reason for insomnia noted in record, and prescription of analgesic treatment.

in prison for at least three months, a majority (78.4%) suffered from chronic forms of insomnia. In only one third (31.3%) of the 51 patients did insomnia complaints disappear after treatment, in 25 (49%) symptoms improved partially, and in 8 (15.7%) no improvement was noted (data not shown).

(5) Results concerning the association between complete, partial or no improvement and characteristics of all 112 patients are shown in table 4. Half of the patients with partial improvement, as compared to only a quarter of those with no improvement received psychological follow up. The majority of patients with complete improvement suffered from insomnia for less than 3 weeks and did not receive psychological help. Patients with partial improvement have been seen more often on consultation than patients without improvement and those with complete improvement. The percentage of patients who had a history of medical or surgical illness was overall high, especially among patients with only partial improvement (94.1% vs. 70% and 78% in the other groups).

Patients with no or partial improvement did not differ significantly from patients with complete improvement of insomnia with respect to sociodemographic characteristics (age, sex, origin, multiple imprisonment). They differed significantly from patients with complete improvement of insomnia as regards the type of treatment. A higher percentage of the first than the second received BDZ treatment (tranquillisers or hypnotics), two BDZ simultaneously, a prescription of chloral hydrate, neuroleptic treatment, a longer duration of hypnotic prescription, and increased doses of hypnotics. In addition, patients with no or partial improvement differed significantly from patients with complete improvement of insomnia in that a higher percentage of the first rather than the second showed characteristics known from the literature to be associated with insomnia: a history of psychiatric illness and psychological problems.

Regression (table 5) shows that the variable "persistence of insomnia" was predicted by the prescription of chloral hydrate, a history of psychiatric illness, and the presence of chronic insomnia.

(6) 62 (55.3%) of the 112 prisoners left Champ Dollon with hypnotics still being prescribed. Compared to the remaining insomniac patients, these 62 patients received a higher mean number and a longer duration of hypnotic prescriptions, the dose of which had been more often increased. They suffered more often from chronic insomnia and showed less often complete improvement of insomnia (table 6).

Discussion

Physician's insomnia management

The insomnia work-up that physicians documented in the record was very limited compared to current recommendations [5–8]. It contained information gleaned in the history about sleep habits, sleep latency and previous hypnotic use for less than a third of the 112 patients, and about impact of insomnia on daily activity in only 8%. It is possible, but does not seem very likely that the general practitioners took more complete histories of insomnia than they noted in the medical record. The general practitioners who worked at the prison during the study period mostly belong to the group of medical residents trained in general practice at the University Hospital at Geneva and could therefore be considered to represent the attitudes and knowledge of general practitioners in the middle or at the end of their university train-

Table 5

Binary logistic regression of the dependent variable "persisting insomnia problems": partial or no improvement of insomnia (value = 1, n = 54) versus complete improvement of insomnia (value = 0, n = 41).

Model	Variables[a] and covariates[b] entered	Patient number	B	p-value	Odds ratio	95% CI for Odds ratio
1	type of insomnia (chronic insomnia = 1)	98	+3.5	<0.001	32.9	6.3 – 170.4
	length of imprisonment (days)		<0.01	0.5	1.0	1.0 – 1.0
	age (years)		+0.04	0.2	1.0	1.0 – 1.1
	gender (m = 1)		–1.3	0.2	0.3	0.4 – 2.0
	Swiss		+0.6	0.6	1.7	0.2 – 18.8
	European		–0.03	1.0	1.0	0.2 – 4.7
	African		+0.6	0.5	1.8	0.3 – 9.3
2	Chloral hydrate	112	+2.0	0.002	7.1	2.1 – 24.3
	length of imprisonment (days)		<0.01	0.07	1.0	1.0 – 1.0
	age (years)		+0.03	0.4	1.0	1.0 – 1.1
	gender (m = 1)		–0.8	0.3	0.4	0.1 – 2.4
	Swiss		+0.4	0.7	1.4	0.2 – 11.4
	European		–0.6	0.3	0.5	0.1 – 1.8
	African		–0.2	0.8	0.2	0.3 – 3.2
3	Psychological history or problem	112	+1.3	0.01	3.8	1.3 – 10.5
	length of imprisonment (days)		<0.01	0.2	1.0	1.0 – 1.0
	age (years)		+0.04	0.09	1.0	1.0 – 1.1
	gender (m = 1)		–1.4	0.1	0.3	0.1 – 1.4
	Swiss		+0.7	0.5	2.0	0.3 – 15.2
	European		–0.3	0.6	0.8	0.2 – 2.6
	African		–0.4	0.5	1.5	0.4 – 5.4
4	type of insomnia (chronic insomnia = 1)	98	+3.6	<0.002	35.9	5.4 – 239.9
	chloral hydrate		+1.8	0.02	6.2	1.3 – 31.4
	psychological history or problem		+2.1	0.009	8.1	1.7 – 39.1
	length of imprisonment (days)		<0.01	0.9	1.0	1.0 – 1.0
	age (years)		+0.04	0.3	1.0	1.0 – 1.1
	gender (m = 1)		–1.5	0.2	0.2	0.0 – 2.0
	Swiss		+0.1	0.9	1.1	0.1 – 15.9
	European		+0.5	0.6	1.7	0.3 – 11.3
	African		+0.4	0.7	1.5	0.2 – 10.0
5	chloral hydrate	112	+2.2	0.001	9.1	2.4 – 35.0
	psychological history or problem		+1.6	0.008	5.1	1.5 – 16.8
	length of imprisonment (days)		<0.01	0.2	1.0	1.0 – 1.0
	age (years)		+0.03	0.3	1.0	1.0 – 1.1
	gender (m = 1)		–1.0	0.3	0.4	0.1 – 2.2
	Swiss		+0.2	0.8	1.3	0.2 – 10.2
	European		–0.3	0.7	0.8	0.2 – 2.8
	African		+0.1	0.9	1.1	0.3 – 4.3

[a] Variables entered were those supposed from our experience and the literature to influence improvement: psychological history or problem, type of insomnia, chloral hydrate, BDZ, follow up by psychologist. All were significant except BDZ and follow up by psychologist (data of these two are not shown).

[b] multivariate analysis: as covariates always used were length of imprisonment, age, gender and nationality (categorical: Swiss, European, African versus other).

ing. A limited insomnia work-up has also been reported from other studies and is not particularly related to the prison setting. Shorr and Bauwens [13] examined the medical records of 536 patients who received hypnotic medication and found a reference to sleep in only 12% of notes written by physicians working in internal medicine and surgeons. According to another study [14], fewer than half of 799 primary care practitioners obtained any sleep history. In our study, compared to the notes concerning other complaints, the physicians seemed to accord less importance to insomnia. This could reflect either a lack of knowledge, a lack of time or interest, or the impression that this information from the history would not change the choice of treatment. The patient's and doctor's evaluation as to the cause of insomnia was noted in a relatively high percentage (70%, n = 81) of the studied records. In 83% of these 81 patients, the reason seemed to have been some form of anxiety (n = 48), depression (n = 7) or other factors directly related to imprisonment (n = 7) or its conditions (isolation cell: n = 3). Although physicians seemed to be aware that psychological problems may be the main cause of insomnia, they referred less than a third of the 112 patients to a psychologist or psychiatrist for anxiety follow up. Otherwise, the stereotypical response to an insomnia complaint was the prescription of a hypnotic in all, but one patient. According to the doctors' notes and the patients' written requests for consultations, this reflected in almost 60% of cases the patients' desire: they had consulted mainly in order to obtain hypnotics. In the remaining 40% of patients we do not know what determined the prescription. Against current recommendations, physicians prescribed the majority of hypnotics for more than three weeks, and one third for more than three months. The verbal recommendation given to physicians working at the prison outpatient clinic had been not to abuse hypnotics prescription. The most probable reasons for the stereotypical prescription of a hypnotic, mostly of long duration, are either in these cases patient's desire that has not been expressly noted in the record, and/or the physician's impression that the only effective way to treat insomnia is with hypnotic medication. It is known from other studies that the management of insomnia by general practitioners is in most cases the prescription of a hypnotic. In an Australian study, benzodiazepines were the sole management of insomnia recorded by the surveyed general practitioners in 93.5% of cases, whereas, in comparison, non-drug management was offered to more than a third of patients with anxiety and depression [15].

Although almost 80% of insomnia patients declared psychological or psychiatric problems, the general practitioners referred fewer than one third of the 112 patients to a psychologist or psychiatrist for anxiety follow up. The reason for this seems to be that in the majority of cases anxiety is interpreted by the general practitioners as a normal reaction to imprisonment and transient prescription of hypnotics is judged to be the adequate reaction. In addition, limited staff and consultation capacities would not have permitted providing psychological follow up to all insomniac patients suffering from anxiety. However, given the risk of developing chronic forms of insomnia, it must be asked whether it would be the more efficient treatment to prescribe psychological support to a greater percentage of insomniac patients.

Regression analysis shows that the number of BDZ and the total number of hypnotics prescribed is related to the length of prison stay. Linear regression showed that 12% of the variance of the total number of hypnotics prescribed is explained by the length of imprisonment (data not shown).

Table 6

Comparison of characteristics of prisoner patients leaving prison with hypnotics still prescribed vs. prisoner patients without such prescriptions among the 110 non-substance-misusing insomnia patients (shown only if significant differences between patients with versus without hypnotics when leaving prison*).

Characteristic of 110 patients N (%) of 110	BDZ or Zolpidem[b]		p[a]	Chloral hydrate[c]		p[a]	All hypnotics[d]		p[a]
	Yes n = 50	No n = 60		Yes n = 11	No n = 99		Yes n = 62	No n = 48	
N of hypnotics (shown hypnotics >1)	29 (58.0)	30 (50.0)	0.06	10 (90.9)	49 (49.5)	0.02	39 (62.9)	20 (41.7)	0.002
Hypnotic prescription length: <3 weeks / 3 weeks-3 months / >3 months (% rounded)	32% / 34% / 34%	47% / 23% / 30%	0.3	9% / 46% / 46%	43% / 26% / 30%	0.085	29% / 36% / 36%	54% / 19% / 27%	0.02
Type insomnia (transitory / chronic (not known: 14 of the 110 patients)	8 (19.0) / 34 (81.0)	24 (44.4) / 30 (55,6)	0.01	1 (9.1) / 10 (90.9)	31 (36.5) / 54 (63.5)	0.09	10 (18.5) / 44 (81.5)	22 (52.4) / 20 (47.6)	0.001
Dose increased	12 (24.0)	7 (11.7)	0.1	4 (36.4)	15 (15.2)	0.095	16 (25.8)	3 (6.3)	0.01
Improvement no / partial / complete (% rounded, not known: 17 patients)	34% / 37% / 29%	13% / 33% / 55%	0.016	46% / 46% / 9%	18% / 33% / 49%	0.027	37% / 39% / 25%	5% / 30% / 66%	<0.001
Expulsed (deportation)	18 (36.0)	19 (31.7)	0.9	2 (18.2)	35 (35.4)	0.03	20 (32.3)	17 (35.4)	0.3

* For two patients data not clear whether hypnotics still prescribed when leaving prison.

[a] Chi-squared for dichotomous and trichotomous variables; Mann-Whitney Test for independent samples for continuous variables (number of hypnotics).

[b] comparison between patients leaving prison with BDZ or Zolpidem still prescribed vs. patients leaving prison without such a prescription

[c] comparison between patients leaving prison with chloral hydrate still prescribed vs. patients leaving prison without such a prescription

[d] comparison between patients leaving prison with hypnotic (all types) still prescribed vs. patients leaving prison without such a prescription

This is an important finding that we did not expect to this degree, because physicians are advised to prescribe hypnotics rather at the beginning of incarceration and to avoid chronic prescriptions and increases of doses and numbers of hypnotics. However, our study shows clearly that this is what happens.

Type of treatment and factors associated with it

Most patients received more than one hypnotic consecutively or simultaneously (mean 1.8 ± 0.9). The type and number of hypnotics was *not* associated with sociodemographic characteristics such as age, gender or nationality. Type and number of hypnotics prescribed were associated with patients' desire for pharmacological treatment, multiple imprisonment and length of imprisonment. The desire for pharmacological treatment and the length of imprisonment were associated with "heavier" treatment, ie, one or two BDZ or chloral hydrate, as compared to Zolpidem or herbal treatment. Patients receiving 2 BDZ had particularly long prison stays (median 200 days). The percentage of prisoners with multiple imprisonment was significantly higher among patients receiving 2 BDZ simultaneously than among patients receiving fewer BDZ or another type of hypnotic. A possible explanation for these findings is that previous experience with BDZ during multiple and long prison stays increases patients' desire for them. This hypothesis is supported by the association of the number of BDZ with the fact that patients asked to receive a hypnotic (72.4% of patients with 2 BDZ, vs. 64.9% and 41.3% of patients with two or no BDZ, $p < 0.01$).

Patients who received "heavy" treatment, ie, two BDZ simultaneously or chloral hydrate were significantly different (the latter to a lesser extent) from all other patients receiving hypnotics (table 2). Receiving "heavy" treatment was associated with factors known to be possible causes for insomnia: a higher percentages of patients receiving "heavy" treatment had a history of psychiatry illness (24.1% vs. 3–14% in the other treatment groups), psychological problems (93% vs. 50–65%; chloral hydrate treated patients: 71%). In line with these findings, receiving "heavy" treatment was also associated with factors indicating psychiatric co-morbidity: a higher percentages of patients with "heavy" treatment received antidepressant treatment (28% vs. 2–7%), neuroleptic treatment (28% vs. 0–5%, chloral hydrate treated patients: 14%), and follow up by a psychologists (55% vs. 17–24%). In addition, receiving "heavy" treatment was associated with factors indicating the severity of insomnia: a higher percentages of patients with "heavy" treatment suffered from chronic insomnia (90% vs. 28–73%, chloral hydrate treated patients: 86.2%), received increased doses of hypnotics (45% vs. 2–19%, chloral hydrate treated patients: 38%), and complained of no or only partial improvement (83%, vs. 13–57%, chloral hydrate treated patients: 83%). Weyerer and Dilling have reported that moderate/severe insomnia was strongly related to psychiatric diagnosis and that the consumption of hypnotics and other psychotropic drugs among moderate/severe insomniacs was significantly higher (48.5%) than that in mild insomniacs (20.4%) [16]. In our sample, the longer duration of insomnia in spite of treatment and the need to increase the dose in prisoner patients treated with 2 BDZ or chloral hydrate could indicate that these patients suffered from more severe insomnia than patients treated with only one BDZ, Zolpidem or a herbal prescription.

Effectiveness of treatment and factors associated with subjective improvement of insomnia

We did not use any control group nor any standardised measure of improvement. However, the records reflect the patient's subjective feeling about his/her suffering from insomnia and reflect his/her ongoing or not ongoing complaints in letters and consultations appointed for insomnia. We therefore do not know exactly whether insomnia improved, but were able to measure insomnia complaints. Overall, only a minority of patients (36.6%) had the impression that treatment improved their insomnia completely. In one fifth of patients (18%), no improvement was noted, and in 30% at least partial improvement has been recognised. A recent meta-analysis showed that benzodiazepine hypnotics and zolpidem produced reliable improvement of chronic insomnia but median follow up had only been 7 days [17]. In our study, the majority (60.7%) of the 112 insomniac patients suffered from chronic insomnia (>3 weeks [9]). Improvement was associated with the type of treatment. Improvement was related inversely to chloral hydrate prescription and psychological/psychiatric history or problems (table 5). The association of improvement with the type of treatment in this retrospective setting does not allow a conclusion about the efficacy of the respective treatment, in particular since the criteria for improvement are only weakly defined. The following conclusions should be appraised critically taking into account the limitations described. The association of type of hypnotic and improvement in our sample could mean that some hypnotics, especially chloral hydrate, have less effect at least on chronic anxiety related insomnia complaints in prison than other treatments. An alternative explanation at least partially supported by our data would be that physicians chose the type of hypnotic according to the severity and other psychiatric problems associated with insomnia: in more severe and more chronic insomnia in patients suffering from psychiatric problems they prescribed more often chloral hydrate (in the majority of cases together with one or two BDZ). These treatments would therefore appear to have less effect only because the insomnia and associated psychological prob-

lems were more severe. However, at least for chloral hydrate, this explanation is not sufficient and there is evidence that chloral hydrate is less efficient for insomnia treatment in prison. Although fewer patients treated with chloral hydrate than with two BDZ had a history of psychiatric illness or suffered from psychiatric problems, chloral hydrate treated patients showed to a higher percentage no improvement of subjective insomnia. Thus, our results are in line with patients' complaints that chloral hydrate does not sufficiently relieve their insomnia. However, we cannot completely exclude that patients receiving chloral hydrate continue to complain of insomnia mainly because they desire a prescription of BDZ that can more easily be sold to drug dependent inmates than chloral hydrate.

In a study of Hohagen et al. [18], 22% of severely insomniac patients reported that sleep problems had considerably improved by taking the prescribed hypnotic, whereas about two-thirds of patients with severe insomnia felt no or only little effect on insomnia by taking medication for sleep. Comparison with our data is difficult as in our study, information about the severity of insomnia is not standardised, and the prevalence of psychiatric disorders has not been evaluated according to reliable criteria at Champ Dollon. The fact that patients from our study treated with either 2 BDZ or with chloral hydrate had similar low improvement rates (in about 1/5th of cases) might point to the severity of their insomnia. Independently of the severity of insomnia in prison, it can be concluded that drug treatment of insomnia at Champ Dollon in many patients is not efficient at relieving insomnia according to subjective criteria (patients' feed back to nurses and physicians).

Duration of imprisonment and multiple imprisonment were not associated or associated in the opposite way than we had postulated. Patients with complete improvement had shorter prison stays than those without or with only partial improvement, and no significant association was found between multiple imprisonment and improvement. Our hypothesis that among NSM patients complaints of transitory insomnia, ie, <3 weeks, related to the stress of the new environment, are predominant and decrease with duration and numbers of imprisonment has not been confirmed. We also did not find any association between improvement and age, gender or nationality that we had suspected.

Improvement of insomnia in NSM prisoners was inversely associated with a history of psychiatric illness. In addition, we found, as we expected, an association between improvement and psychological problems, because for 70–88% of patients with no or partial improvement, but only for 53% of patients with total improvement such problems were reported (data not shown). It is known from other studies [19–22], that individuals with chronic insomnia report elevated levels of stress, anxiety, depression and medical illness. The extent to which sleep disturbances are the cause or the result of these medico-psychiatric problems is not clear. Our results speak in favour of the latter. First, patients named in their letters and physicians noted in the records for the majority of cases that the reason for insomnia was anxiety and depression related to imprisonment. The records showed that new episodes of insomnia were noted at points of the legal procedure when the patient perceived a particularly threat to his/her future. Psychiatric illness was in most cases prior to imprisonment and insomnia. A significantly higher number of patients with partial improvement of insomnia than of patients with no improvement had psychological follow up and received antidepressant treatment. The reason for this could be that psychological problems are more hidden in patients with persistent complaints about no improvement of insomnia. These patients might benefit from psychological consultations and antidepressant treatment to obtain at least partial improvement of insomnia.

Risk of inducing chronic use of hypnotics

Unfortunately, the results of our study are insufficient to determine the risk of inducing chronic use or dependency, because in more than 80% of patients a history of previous hypnotic use was not taken or at least not noted in the record. We therefore do not know how many patients received hypnotics for the first time in prison. Other studies from France and Switzerland show that in the general population of age groups predominant in our prison sample, the percentage of hypnotic use is about 5% [23] to 10% [24], but we cannot prove that the percentages are the same among prisoners. If it is true that only a minority of NSM prisoner patients has been taking hypnotics before, leaving prison with hypnotics prescription still ongoing might provoke withdrawal symptoms and encourage further hypnotic use outside prison.

Of the 62 (55% of the 112 insomnia patients from our sample) prisoners leaving Champ Dollon with hypnotics still prescribed, 11 were transferred to another prison, 20 expelled (8 to European, 7 to African, 2 to American, and 3 to Asian countries), and 31 were freed. The main reason for this finding is that expulsion, freeing or transfer is often sudden and unexpected by patients and doctors so that medication withdrawal has not been planned. A follow up of prisoners after incarceration is difficult and has not been done in this study. Therefore nothing is known about whether consumption of hypnotics continued. We conclude, however, that a high percentage (55%) of all non-substance-misusing insomniac patients are at risk of continuing hypnotic use after having stayed in our remand prison.

It is unclear to which extent this percentage could decrease. To make a definite judgment of prison general practitioners' clinical management of insomnia is difficult. As is the case outside prison, insomnia history and work-up needs to be improved. However, this does not necessarily

imply that hypnotic prescription will decrease. According to our personal experience, physicians working in Champ Dollon often complain about pressure from patients to obtain medication for sleep. If a prison physician is not successful in convincing a patient not to take hypnotics, should he "refuse" hypnotic prescription to a patient who insists and who is at risk of taking more dangerous substances sold on the prison "black market"? More empirical studies should be undertaken in prison to help physicians address this ethical problem in an evidence based way, ie, with a clearer idea about the benefit-harm ratio.

Weaknesses

The weaknesses of our study are related to its retrospective nature. However, a randomised experiment in prison is ethically problematic. We only studied records, so improvement, psychological problems, other symptoms and physicians' management can only be judged according to what has been written in the record and in patients' letters and is limited and depends on the evaluation skills of the consulting physician or other team members (psychologists etc.) who are involved in patients' follow up. Since we did not use blood or hair screening nor systematic history of drug misuse, the criterion "substance misuse" might underevaluate the real percentage of regular consumers of illicit drugs, alcohol and BDZ. However, this is not very likely, because according to ours and others' experiences the methodology we used seems to be reliable [25, 26].

Another methodological weakness of our study is that large numbers of tests done comparing pairs of groups can generate significant results by chance alone. However, the consistency of the various results within our study as well as with other studies in this area speaks against the influence of chance alone.

In spite of these weaknesses our study gives interesting insights about the extent to which insomnia constitutes a significant burden for primary care physicians in prison, to the characteristics of non-substance-misusing patients complaining about insomnia in prison, and to the management and the global course of their insomnia complaints during imprisonment.

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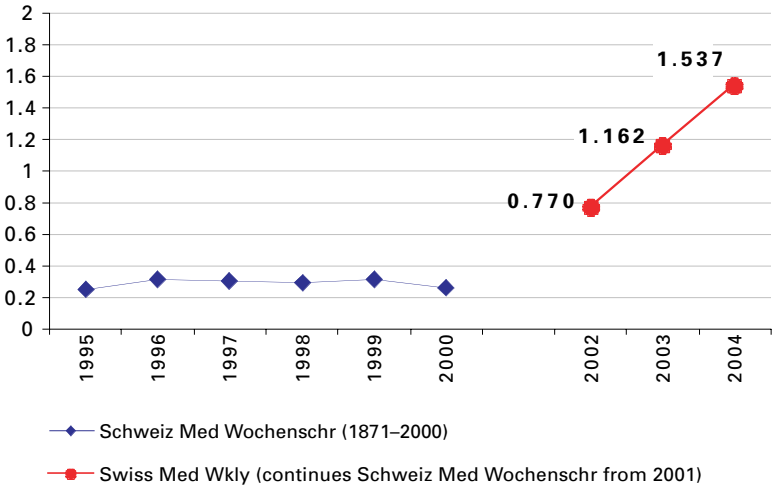

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