INTRODUCTION

Patients in early alcohol recovery have high rates of sleep disturbances. The rates of insomnia in this population could be as high as 36–72% (Foster et al., 1998; Brower et al., 2001). During early recovery, alcoholic patients have increased sleep onset latency (SL) and a decreased total sleep time (TST) (Drummond et al., 1998). Sleep efficiency and the percent of slow-wave sleep are also reduced in early recovery. Sleep problems may continue for many months following alcohol withdrawal. Subjective sleep measures did not show improvement over 12 weeks in one longitudinal study (Cohn et al., 2003).

On subjective reports, Increased SL and poor sleep quality have been associated with an increased risk of relapse even after accounting for the severity of drinking and other Axis I diagnoses (Foster et al., 1998). An increased SL and a decreased TST on polysomnograms are also associated with relapse (Drummond et al., 1998). A decreased REM latency and increased REM density are also found to be associated with early relapse (Gillin et al., 1994). Although there is evidence to suggest that alcohol is associated with a worsening of sleep-disordered breathing and periodic limb movements (PLMS), most research has concentrated on insomnia occurring in the context of alcohol dependence (Brower, 2001). In this systematic review, we limit ourselves to the treatment of insomnia in patients with alcohol dependence.

It follows intuitively that treating sleep problems adequately in this patient population may lead to a reduction in relapse. The treatment of insomnia in alcoholic patients has been poorly studied. In addition, treating sleep problems in alcoholics in recovery is complicated by the fact that some of the most commonly used medications to treat insomnia are thought to have a high abuse potential and clinicians are rightfully wary of using them in this patient population. A survey found that a majority of clinicians did not offer these patients any medication (Friedmann et al., 2003).

Although a previous paper has examined this topic, a systematic review of all pharmacological agents has not been performed (Arnedt et al., 2007). In order to synthesize the available literature and to provide clinicians with the best current evidence on treating insomnia in alcoholic patients, we conducted a systematic review of the pharmacological treatment of sleep problems in alcohol recovery.

METHODS

We attempted to identify all studies of pharmacological agents used to treat sleep problems in patients with alcoholism. In accordance with the Quorum statement, we performed a search of all common databases including PubMed, EMBASE, Psych Info and Medline. The search terms used were alcohol, insomnia/sleep and treatment/management with no year/language restrictions. Results: The search revealed 1239 articles and 20 met inclusion criteria. Trazodone was compared against placebo and found to be superior in two trials. Trazodone and gabapentin improved sleep measures with gabapentin performing significantly better in an open-label study. The data regarding gabapentin are equivocal with few studies showing a clear benefit. In one randomized trial, topiramate resulted in improved subjective sleep measures and a reduction in the percentage of heavy drinking days. Two randomized control trials of carbamazepine revealed improvement in subjective sleep measures. A randomized study showed lorazepam was better than zopiclone on some measures. In a small placebo-controlled trial, acamprosate was found to result in improvements on some sleep measures. In single, small, mostly open-label studies, quetiapine, triazolam, ritanserin, bright light and magnesium have shown efficacy, while chloromethiazole, scopolamine and melperone showed no difference or worsening. Conclusion: Trazodone has the most data suggesting efficacy. This finding is tempered by a study suggesting its association with a return to heavy drinking in some patients. Data regarding the efficacy of gabapentin are unclear at this point.
results

trazodone

Trazodone is a sedating antidepressant which acts predominantly on the serotonergic system. It is one of the most commonly prescribed sleep aids in patients with alcohol dependence (Friedmann et al., 2003). It is not habit forming and has no abuse potential which might explain why it is frequently prescribed in patients with alcohol addiction. Our search revealed two studies of trazodone used to treat sleep problems following cessation of alcohol use.

A small, placebo-controlled trial of 16 patients following detoxification and a 2-week washout period revealed an improvement in some polysomnographic (PSG) sleep measures (Le Bon et al., 2003). Trazodone was started at 50 mg and gradually increased to a dose of 200 mg. In cases where this was not tolerated, a dose of 150 mg was used. A polysomnogram was performed on Days 1, 2 (prior to receiving trazodone), Day 3 (first dose of trazodone, 50 mg) and on Day 28. No drinking measures were used in this study.

Wake-time after sleep onset (WASO) was improved on Days 3 and 28. Sleep efficiency was improved on Day 3, but on Day 28 the difference between the trazodone group and the placebo group was not significant. The total non-rapid eye movements sleep percentage was also improved on Day 3 but not on Day 28. Clinical global impression (CGI), a clinician rating of the severity of the patient’s illness and Hamilton Depression Rating Scale (HAM-D) scores were significantly improved in the trazodone group (Guy, 1976).

A large, NIAAA-supported, placebo-controlled trial conducted over a period of 24 weeks in 173 patients right after detoxification revealed that trazodone significantly improved sleep. Patients were prescribed trazodone in the range of 50–150 mg (average of 100 mg) for 12 weeks and following this the trazodone was discontinued (Friedmann et al., 2008).

Trazodone improved sleep as measured by the Pittsburgh Sleep Quality Index (PSQI) at 1 month (Cohen’s d: 0.5) and at 3 months (Cohen’s d: 0.93). Following discontinuation, sleep measures reverted to placebo level.

Abstinence rates were no different between the trazodone and the placebo groups, both being low at 9.1 vs. 14.1%, respectively. However, only 25.3% of patients in this trial reported having received formal alcohol treatment following detoxification. The number of drinks/drinking day were no different between the trazodone and placebo groups at 1 and 3 months. However, after trazodone was discontinued at 3 months, the trazodone groups had a greater increase in the number of drinks per drinking day. In other analyses, the trazodone group also showed a smaller increase in the number of days abstinent.

Gabapentin

Gabapentin is a sedating anticonvulsant medication which is a γ-aminobutyric acid analog. It has been used to treat pain, and there is also evidence that it might treat alcohol withdrawal (Mariani et al., 2006). Gabapentin has also been investigated for potential use as sleep aid in patients following alcohol cessation. Our search revealed one open-label trial and four randomized control trials of gabapentin as a sleep aid for patients following cessation of alcohol use.

An open-label trial compared gabapentin (888 ± 418 mg; range 300–1800 mg) against trazodone (105 ± 57 mg; range 50–300 mg) in 55 patients over 4–6 weeks. Five patients dropped out due to daytime drowsiness. Both groups reported improvement in sleep as measured by the Sleep Problems Questionnaire (SPQ) (Jenkins et al., 1988). However, the gabapentin group reported more improvement in SPQ scores as compared with the trazodone group. No relapse measures were used. Also, patients of the trazodone group were more likely to report daytime tiredness (Karam-Hage and Brower, 2003).

A double-blind trial comparing gabapentin against lorazepam for the treatment of alcohol withdrawal over a 4-day period provided data on daytime sleepiness (Myrick et al., 2009). A total of 100 individuals were randomized to receive gabapentin (900 mg tapering to 600 mg or 1200 mg tapering to 800 mg) or lorazepam (6 mg tapering to 4 mg). The patients were followed for a total of 12 days. Gabapentin was administered in three divided doses through the day, as was the lorazepam.

The daytime sleepiness as measured by the Epworth scores was lower in the high-dose gabapentin group when compared with the lorazepam group. Although the follow-up period was short, the authors did comment on the probability of patients returning to heavy drinking. Patients of the gabapentin group were more likely to drink on the first day of medication. Although the probability of relapse was low on the following days, it increased slowly over the
post-treatment period. On lorazepam patients were abstinent on the first medication day, they showed an increased probability of drinking thereafter, showing peaks at Day 2 and on Day 6.

A randomized, double-blind trial compared gabapentin (1200 mg), valproate (1500 mg) and placebo for the acute treatment of alcohol withdrawal over 5 days and for 4 weeks later (Trevisan et al., 2008). A total of 57 patients were randomized to gabapentin, valproate or placebo in addition to benzodiazepines in the first 5 days of detoxification. Following this initial phase, the gabapentin, valproate and placebo were continued for 4 weeks. However, gabapentin was administered in three divided doses over the day rather than as a single dose at night.

There were no differences in sleep as measured by the PSQI between the three groups. Also, the three groups did not differ based on the number of drinking days, heavy drinking days or the number of drinks. Abstinence rates were not different among the three groups.

Another randomized, placebo-controlled trial of 21 patients compared gabapentin (1500 mg) with placebo over 6 weeks. Patients with insomnia which persisted after a week of abstinence, in the absence of withdrawal symptoms, received a single-blind placebo run in for a week. During this period, the subjects were instructed to maintain their usual sleep schedule and at the end of the week an initial PSG was performed. Subsequently, they were randomized to either gabapentin or placebo for 6 weeks. Following this, they were tapered off the medication over 4 days. A follow-up visit was scheduled at 12 weeks (6 weeks following the discontinuation of the medication) (Brower et al., 2008).

SPQ scores were available for 14 out of 21 patients at 6 weeks and for 11 out of 21 patients at 12 weeks. Although there was a significant improvement in SPQ scores over the 6 weeks for the entire group, there were no significant differences between the gabapentin and the placebo groups at either 6 or 12 weeks. PSG was performed at the end of the placebo run-in period and after 3 weeks. No significant change over time was observed on the PSG. On the SPQ scores, there was a non-significant trend for patients on gabapentin to do worse between 6 and 12 weeks when compared with the placebo group. This was because sleep in gabapentin group worsened once it was discontinued, while SPQ scores in the placebo group continued to improve. On the PSG measures, there was a trend for patients on gabapentin to have worse SL. Another interesting finding was that patients with a higher change in SPQ scores were less likely to relapse.

Drinking outcomes were limited by lack of data in 6 out of 21 patients. There were no differences in relapse rates between the two groups. The relative risk of relapse to heavy drinking was lower in the gabapentin group.

Another randomized control trial of 60 patients who had their last drink no more than 72 h prior to randomization compared a combination of intravenous flumazenil administered as 2 mg boluses for two consecutive days and gabapentin (1200 mg) administered nightly for 39 days against placebo (Anton et al., 2009). These patients were instructed not to drink on the night prior to the administration of flumazenil. They were assessed on Weeks 2 and 6 following randomization. Sleep was assessed using the Insomnia Severity Index (ISI) and the Epworth Sleepiness Scale (ESS).

The patients in this trial were divided into those with high alcohol withdrawal and low alcohol withdrawal according to their Clinical Institute Alcohol Withdrawal (CIWA) scores at baseline (Foy et al., 1988). Those with CIWA scores >7 were considered high withdrawal and 16 out of 60 qualified.

There appeared to be an interaction between the alcohol withdrawal severity and medication group. Those with low alcohol withdrawal had better sleep if on active medication and those with high alcohol withdrawal appeared to do better if on placebo.

The effect on drinking measures was the opposite with the high alcohol withdrawal group having more days of abstinence and longer time to first heavy drinking if on the active medication. This was also true for complete abstinence.

**Zopiclone**

Zopiclone is a non-benzodiazepine benzodiazepine receptor agonist that is currently unavailable in the USA. An enantiomer of zopiclone, eszopiclone is available in the USA and is FDA approved for the treatment of insomnia. Although it is commonly prescribed for the treatment of insomnia in the general population, there is some concern that this medication may have abuse potential (Hajak et al., 2003). This is likely to be a reason these medications are less commonly prescribed in the addiction populations. Our search revealed a single, double-blind trial comparing zopiclone with lorazepam.

Fifty-four patients were entered in the study of which 52 patients were analyzed. The patients were tapered off alcohol and then underwent a 2-day placebo run in period following which they were randomized to receive the active medication. Twenty-seven patients received 7.5 mg of zopiclone at night, while 25 patients received 1 mg lorazepam (dose equivalent of 6.5 mg of diazepam) (Ansoms et al., 1991).

Sleep was measured using the Spiegel Sleep Questionnaire and mood and behavior at awakening was measured using a visual analog scale. All the sleep measures showed a trend toward improvement over the 5-day treatment period. The time to fall asleep was the only measure which improved significantly in the lorazepam group. The zopiclone group showed significant improvements in daytime mood and behavior and were reporting more attentiveness and being more alert. No measures of alcohol relapse were included.

**Topiramate**

Topiramate is a sedating anti-seizure (or anticonvulsant) medication that is thought to help reduce relapse to alcohol. A single, large, multicenter trial of 371 alcoholic subjects was performed over 14 weeks. Patients in this trial were randomized to topiramate (50–300 mg) or placebo, and abstinence was required during the study period. Sleep was measured using the Medical Outcomes Study Sleep Scale. Topiramate use was associated with a reduction in sleep disturbance. Topiramate was also associated with a significant reduction in obsessional thoughts and compulsions about using alcohol and with a reduction in the percentage of heavy drinking days (Johnson et al., 2008).
Carbamazepine

Carbamazepine is an anticonvulsant which is thought to treat acute alcohol withdrawal (Malcolm et al., 2002). Two studies have measured the impact of carbamazepine on sleep in patients with alcohol dependence.

A randomized control trial compared carbamazepine against lorazepam in 136 individuals with alcohol dependence over the course of 5 days. Patients received tapering schedules of carbamazepine and lorazepam over the period of the trial. Sleep was measured using a visual analog scale. Sleep measures, adjusted for time since last drink, revealed no differences on Days 1 and 5, but the carbamazepine group was significantly better on Days 7 and 12 when compared with lorazepam. No relapse measures were included (Malcolm et al., 2002).

Another randomized, double-blind, placebo-controlled trial of carbamazepine in patients with alcohol dependence over 7 days revealed that subjective measures of sleep were significantly better in the carbamazepine group. No relapse measures were used in this trial either (Bjorkqvist et al., 1976).

Acamprosate

Acamprosate is a medication which is thought to be a functional glutamate antagonist. It is thought to help reduce drinking-related parameters in a certain proportion of alcohol-dependent patients (Boothby and Doering, 2005). Acamprosate is thought to have no effects on the sleep of subjects not dependent on alcohol. A single, double-blind, placebo-controlled trial of 24 male alcoholics compared the impact of acamprosate on PSG sleep measures against placebo (Staner et al., 2006).

The patients with alcohol dependence were chosen such that they had low CIWA scores (<8) and did not require benzodiazepines to treat alcohol withdrawal. They were prescribed acamprosate (666 mg t.i.d.) for 8 days prior to alcohol discontinuation and for 15 days following this. Polysomnograms were performed on Day 2 and Day 15 following commencement of acamprosate or placebo.

Acamprosate improved WASO and Stage 3 of sleep and also increased the REM latency but did not impact SL or TST. No relapse measures were used in this trial.

Quetiapine

Quetiapine is an atypical antipsychotic, which is sedating. It is occasionally used off label to treat sleep problems. Although it was initially considered to have low abuse potential, this has recently been questioned (Sansone and Sansone, 2010). Our search revealed a single, open-label trial of quetiapine used to treat psychiatric symptoms and alcohol consumption and cravings.

In this open-label trial, 28 patients with alcohol dependence along with other major Axis I diagnoses received flexible doses of quetiapine (300–800 mg/day) for 16 weeks following 5–10 day detoxification (Martinotti et al., 2008). Sleep measures were obtained from the HAM-D insomnia items. There was a significant reduction in the HAM-D insomnia middle and insomnia late items at the 2-week assessment. There was a significant correlation between the reduction in alcohol withdrawal and craving scores and the HAM-D insomnia middle (r = 0.99; P = 0.0002) and insomnia late items (r = 0.98; P = 0.001).

The authors unfortunately do not comment on the changes in the sleep items at further follow-up visits. Although there is a significant reduction in the gamma-glutamyl transferase (GGT), aspartate aminotransferase (AST), alanine transaminase (ALT) and mean corpuscular volume (MCV) over the study period, there was a 25% drop-out rate, while 32% of patients relapsed to heavy drinking.

Magnesium

An open-label trial of 11 patients evaluated subjective changes in sleep using the PSQI and also changes in sleep measures on polysomnogram following a 4-week trial of magnesium (10 mmol in the a.m. and 20 mmol in the p.m.) (Hornyak et al., 2004).

Patients were detoxified from alcohol and were prescribed magnesium 1 week following detoxification. They received magnesium for 4 weeks, and polysomnograms were performed 2 weeks following detoxification and again at 4 weeks. Subjective changes in sleep were measured using the PSQI (Buysse et al., 1989).

PSQI scores improved significantly over the course of treatment. On PSG measures, only the SL improved significantly over the course of the trial. The authors further divided the groups into those whose PLMS improved (7 out of 11) and those whose PLMS worsened (4 out of 11). On subgroup analyses, the TST of patients with a decrease in PLMS was significantly improved with treatment.

The authors also compared changes in the GGT, CDT, AST and ALT over the course of treatment. The group with a reduction in PLMS also demonstrated a significant reduction in CDT and GGT values over the course of treatment.

Benzodiazepines

Benzodiazepines are extensively used for the treatment of acute alcohol withdrawal. There is a concern about continuing to prescribe these agents after acute detoxification due to the cross tolerance and also concerns about cross addiction and the possibility of precipitating a relapse. Medications such as triazolam and temazepam are some of the commonly used benzodiazepines for the treatment of insomnia.

An open-label trial assessed the use of triazolam (0.5–1 mg) in 23 patients with alcohol dependence over 28 days. Sleep was measured using a sleep diary. Only 12 out of 23 patients completed the trial and were included in the analyses. Over the duration of the trial, there was a significant improvement in self-reported depth of sleep and duration of sleep. There was also a significant reduction in the number of awakenings. Of the initial 23 patients, 4 relapsed to alcohol use (Fabre et al., 1977).

Diazepam was compared with tetrabamate in an open-label trial of 23 patients with alcohol dependence. Patients received 25 mg/day of diazepam for 3 days, 15 mg/day for 3 days and remained on 6 mg/day till PSG. Tetrabamate was similarly dosed at 2700, 1800 and 900 mg/day. Polysomnography was carried out between 15.5 ± 2.7 days for the diazepam group and between 15.1 ± 2.2 days for the tetrabamate group. The TST and N2 sleep was significantly increased in the diazepam group. N3 sleep was significantly
### Table 1. Open label and randomized control trial of pharmacologic agents impacting sleep in early alcohol recovery

<table>
<thead>
<tr>
<th>Authors</th>
<th>Drug (dosage)</th>
<th>n</th>
<th>Duration of trial</th>
<th>Time since last drink</th>
<th>Primary outcome measure</th>
<th>Sleep outcome measure</th>
<th>Results</th>
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</thead>
<tbody>
<tr>
<td>Fabre et al. 1977</td>
<td>Triazolam (0.5–1 mg)</td>
<td>23</td>
<td>28 days</td>
<td>5–15 days</td>
<td>Sleep diaries</td>
<td>Sleep diaries</td>
<td>Improvement in depth, duration and night-time awakenings. Scopolamine delayed REM onset time, increased REM latency and decreased REM time and REM% and REM density. Following discontinuation, a REM rebound occurred. Subjective sleep improved. Sleep latency and latency to N3 reduced. REM sleep increased. Reduced sleep latency on PSG and improved sleep quality on PSQI. Variable changes in PLMS. Both groups improved but gabapentin group improved more significantly. Trazodone group had more day time sedation. Middle and late insomnia was significantly reduced at 2 weeks, no other sleep data presented.</td>
</tr>
<tr>
<td>Gillin et al. 1991</td>
<td>Scopolamine (0.4 mg)</td>
<td>20</td>
<td>Variable</td>
<td>PSG</td>
<td>PSG</td>
<td>PSG</td>
<td></td>
</tr>
<tr>
<td>Schmitz et al. 1997</td>
<td>Bright Light (BL) (3000Lux, 0700–0900 and 1700–2100)</td>
<td>10</td>
<td>Immediate post-withdrawal</td>
<td>PSG</td>
<td>PSG</td>
<td></td>
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<tr>
<td>Hornyak et al. 2004</td>
<td>Magnesium (30 mmol)</td>
<td>11</td>
<td>2 weeks</td>
<td>PSG</td>
<td>PSG and PSQI</td>
<td></td>
<td></td>
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<tr>
<td>Karam-Hage and Brower 2003</td>
<td>Gabapentin (888 ± 418 mg) vs. Trazodone (105 ± 57 mg)</td>
<td>50</td>
<td>4 or more weeks</td>
<td>PSG</td>
<td>PSG</td>
<td></td>
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<tr>
<td>Martinotti et al. 2008</td>
<td>Quetiapine (300–800 mg)</td>
<td>28</td>
<td>16 weeks</td>
<td>Multiple scales</td>
<td>HAM-D’s sleep question subset</td>
<td>Sleep Problems Questionnaire</td>
<td></td>
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<tr>
<td>Aubin et al. 1994</td>
<td>Diazepam (titrating dose 25–15–6 mg/d) vs. Tetrabamate (titrating dose 2700–1800–900 mg/d)</td>
<td>23</td>
<td>12–20 days</td>
<td>PSG</td>
<td>PSG</td>
<td>TST and N2 increased in diapazem group, N3 increased in tetrambate group</td>
<td></td>
</tr>
<tr>
<td>Authors</td>
<td>Drug (dosage) vs. comparator (dosage)</td>
<td>n</td>
<td>Duration of trial</td>
<td>Time since last drink</td>
<td>Primary outcome measure</td>
<td>Sleep outcome measure</td>
<td>Results</td>
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<tr>
<td>Myrick et al. 2009</td>
<td>Gabapentin (900–600 mg;1200–800 mg) vs. Lorazepam (6–4 mg)</td>
<td>100</td>
<td>4-day treatment and 12-day follow-up.</td>
<td>Immediately post-detoxification</td>
<td>CIWA-Ar scores</td>
<td>ESS</td>
<td>ESS was significantly lower in high-dose Gabapentin group during active treatment but not during follow-up.</td>
</tr>
<tr>
<td>Trevisan et al. 2008</td>
<td>Gabapentin (1200 mg) vs. Valproate (1500 or 1200 mg)</td>
<td>57</td>
<td>Detoxification phase for 1 week and f/u for 3 additional weeks</td>
<td>&lt;1 week abstinent or actively drinking</td>
<td>CIWA-Ar and relapse to drinking</td>
<td>PSQI</td>
<td>Sleep improved significantly overtime in both groups.</td>
</tr>
<tr>
<td>Ansoms et al. 1991</td>
<td>Zopiclone (7.5 mg) vs. Lormetazepam (1 mg)</td>
<td>52</td>
<td>2-day placebo washout 5-day treatment</td>
<td>&lt;10 days</td>
<td>Speigel Sleep Questionnaire</td>
<td>Speigel Sleep Questionnaire</td>
<td>Sleep latency was significantly reduced in Lormetazepam group.</td>
</tr>
<tr>
<td>Authors</td>
<td>Drug (dosage)</td>
<td>n</td>
<td>Duration of trial</td>
<td>Time since last drink</td>
<td>Primary outcome measure</td>
<td>Sleep outcome measure</td>
<td>Results</td>
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<tr>
<td>Le Bon et al. 2003</td>
<td>Trazodone (50 mg)</td>
<td>16</td>
<td>4 weeks</td>
<td>2 weeks post-detoxification</td>
<td>PSG</td>
<td>PSG</td>
<td>Sleep efficiency was increased, reduced awakenings, improved non-REM sleep time and WASO.</td>
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<td>Friedman et al. 2008</td>
<td>Trazodone</td>
<td>173</td>
<td>3 months on Rx and 6 month f/u</td>
<td>Immediately post-detoxification</td>
<td>Relapse to drinking</td>
<td>PSQI</td>
<td>Sleep improved significantly in trazodone group during active treatment phase.</td>
</tr>
<tr>
<td>Myrick et al. 2007</td>
<td>Gabapentin (1200 mg)</td>
<td>35</td>
<td>5 days on Rx and 8 day f/u</td>
<td>Actively drinking</td>
<td>Drinking or craving</td>
<td>ESS</td>
<td>No difference between the two groups on ESS at Day 6.</td>
</tr>
<tr>
<td>Anton et al. 2009</td>
<td>Gabapentin(1200 mg) + flumazenil (2 mg incremental boluses on Days 1 and 2)</td>
<td>60</td>
<td>0 days</td>
<td>Percent days abstinent during Rx</td>
<td>ESS, PSQI and ISI</td>
<td></td>
<td>Low alcohol withdrawal (AW) group (CIWA &lt; 7) had better sleep on active drug and high AW did better on placebo. Active medication group had low ESS scores.</td>
</tr>
</tbody>
</table>
Increased in the tetrabamate group. No abstinence measures were used (Aubin et al., 1994).

Other trials evaluated the efficacy of ritanserin, melperone, clomethiazole and scopolamine (Carlsson and Gullberg, 1978; Gillin et al., 1991; Monti et al., 1993; Gann et al., 2004). These agents are not commonly prescribed to treat sleep problems or alcohol dependence. The results of these trials are summarized in Table 1 and are not described further as they are of limited clinical utility.

**DISCUSSION**

Insomnia is very common in alcohol recovery and is a robust predictor of relapse. Insomnia also has a significant impact on quality of life and mood and could have a detrimental effect on the patient’s physical health. The literature regarding the treatment of insomnia in patients with alcohol dependence is sparse and limited by various factors (Brower, 2003).

Insomnia is defined as ‘a complaint of difficulty initiating sleep, difficulty maintaining sleep or waking up too early or sleep that is poorly restorative in nature’ and is poorly correlated to PSG findings (ICSD, 2005). Questionnaires used to measure insomnia are varied and not all of them are standardized. The studies in our systematic review used different measures of insomnia, making comparisons difficult. In addition, the studies have had varying patient populations, in different types of alcoholism treatment and in various stages of recovery. The course of sleep problems in early recovery is poorly understood and comparing studies recruiting patients who are in different stages of recovery is difficult. The studies have not uniformly measured alcohol relapse, with some studies not including any measures to identify alcohol relapse. This is a very important aspect of any study of pharmacological agents in patients with alcohol dependence and its absence seriously limits the utility of a study.

Trazodone is an agent that is most commonly used to treat sleep problems in this patient population (Friedmann et al., 2003). In a double-blind study, it did result in an improvement on the CGI. However, among sleep measures, only the WASO was improved at 28 days when compared with placebo. Another large study of trazodone showed a significant improvement in PSQI scores at 3 months and deterioration to placebo level after discontinuation. However, this study did raise some concerns regarding the potential of trazodone to decrease the number of days abstinent. This has been called into question in a retrospective analysis in a different population (Kolla et al., 2011).

Gabapentin has the advantage of being exclusively renally cleared. This could be an advantage in patients with alcohol-induced liver damage. The studies with gabapentin in this patient population have had contrasting results. An open-label trial found that gabapentin and trazodone improved sleep when compared with placebo on subjective measures. However, two well-conducted randomized control trials did not find any difference between gabapentin and placebo on PSG and subjective measures, with one study finding a non-significant trend of worsening of sleep on gabapentin. Some studies have found that gabapentin could enhance abstinence from alcohol but these have not included sleep measures (Furieri and Nakamura-Palacios, 2007). This

<table>
<thead>
<tr>
<th>Study</th>
<th>Drug</th>
<th>Dose</th>
<th>Duration</th>
<th>Post-detoxification</th>
<th>Time</th>
<th>PSG</th>
<th>PSQ</th>
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<tr>
<td>Brower et al. 2008</td>
<td>Gabapentin (titrated to 1500 mg)</td>
<td>Titrated to 1500 mg</td>
<td>21 days</td>
<td>21 days</td>
<td>21 days</td>
<td>PSG</td>
<td>PSG</td>
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<tr>
<td>Johnson et al. 2006</td>
<td>Trazodone</td>
<td>100 mg</td>
<td>4 weeks</td>
<td>28 days</td>
<td>28 days</td>
<td>PSG</td>
<td>PSG</td>
</tr>
<tr>
<td>Sauer et al. 2006</td>
<td>Acamprosate (666 mg t.i.d.)</td>
<td>24 days post-detoxification</td>
<td>24 days</td>
<td>24 days</td>
<td>24 days</td>
<td>PSG</td>
<td>PSG</td>
</tr>
<tr>
<td>Carlson and Gullberg 1978</td>
<td>Clomethiazole (50 mg t.i.d.)</td>
<td>30 days</td>
<td>30 days</td>
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<td>PSG</td>
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<tr>
<td>Gann et al. 2004</td>
<td>Melperone (50 mg t.i.d.)</td>
<td>10 days</td>
<td>10 days</td>
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<td>10 days</td>
<td>PSG</td>
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<td>Monti et al. 1993</td>
<td>Chlorpromazine (10 mg)</td>
<td>10 days</td>
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property of gabapentin could be an effect common to other antiepileptic drugs. However, there are also concerns about the possible abuse potential of gabapentin which could limit its use in this patient population (Markowitz et al., 1997).

Non-benzodiazepine and benzodiazepine receptor agonists are among the most commonly prescribed agents for insomnia in the general population. However, there are concerns that these drugs could be abused (Hajak et al., 2003). Our search identified a single study of zopiclone used to treat insomnia in alcoholics. This study was of short duration and did not include any relapse measures. Further systematic research into the use of these agents is required before we can conclude whether they are efficacious or harmful in this patient population.

Open-label trials showed some promise for both magnesium and bright light. Their use in this group of patients should be investigated further given their low side-effect profile and abuse potential. Acamprosate, which is used to enhance sobriety in alcoholics also influences their sleep and has been shown to improve WASO and Stage 3 sleep in a placebo-controlled trial. A large, double-blind study of topiramate indicated improvements in sleep and in relapse measures, but the data regarding sleep were minimal.

CONCLUSIONS

The research into treating insomnia in alcoholics is limited. Insomnia in this patient population is an important target symptom which lends itself to both easy measurement and potential treatment. Given its association with relapse further systematic research in this area is required. Trazodone and gabapentin have been studied more frequently when compared with other agents, but the evidence to support their use is still equivocal with studies resulting in conflicting findings. Nonetheless, at this point in time, these agents have the most evidence to support their use in this population.

REFERENCES


