

Melatonin effective for preventing or reducing jet lag from air travel.

Key Points

- Air travel across several time zones, especially in the eastward direction, disturbs the body's circadian cycle and causes jet lag.
- Melatonin, a hormone naturally produced in the body, helps regulate the body's sleep-wake cycles.
- There is sound evidence that melatonin taken orally reduces jet lag symptoms.

Background

Air travelers who cross several time zones often suffer from jet lag. A National Sleep Foundation survey of adults living in the United States found that about half of all business travelers experience jet lag. Jet lag occurs when the body's circadian system is out of step with the day-night cycle at the new destination. Symptoms of jet lag include fatigue, disturbed sleep, loss of mental efficiency and irritability. These symptoms are exacerbated by sleep loss during travel. Jet lag is more pronounced as more time zones are crossed and when travel is eastbound.

Melatonin, a hormone that is naturally produced by the pineal gland in the brain, regulates the body's sleep-wake cycle. The release of melatonin is cyclical during a 24-hour period, being inhibited by bright light and triggered by dim light. During travel, it takes several days for the production of melatonin to be synchronized with the new day-night cycle.

Orally administered melatonin has been used to treat sleep disorders as well as jet lag. When taken in the late afternoon it advances endogenous melatonin release thus moving the sleep cycle forward. In contrast, when melatonin is taken in the morning it counteracts the effect of bright light causing a phase delay. Carefully timed physical exercise, exposure to bright light in the morning and avoidance of light at night are some alternative strategies recommended for treating jet lag.

Review Objective

To assess the effectiveness of orally administered melatonin to prevent or alleviate jet lag resulting from air travel across several time zones

To assess the effectiveness of different dosages of melatonin

Review Main Findings

Melatonin taken at bedtime decreased jet lag in people crossing 5 or more time zones.

While the effectiveness of dosages between 0.5 to 5 mg of melatonin were similar, 5 mg of melatonin caused people to fall asleep faster and sleep better.

Available evidence suggests that 1 of every 2 persons would benefit from taking melatonin.

Adverse effects associated with melatonin use are rare. However, its use is best avoided in people with epilepsy and those taking anticoagulants.

Review Implications for Practice

Melatonin is beneficial for preventing or alleviating jet lag in adult travelers crossing several time zones. Melatonin is effective when taken at bedtime on the day of travel at the destination, and on the following 2-5 days.

Since there are no data on the benefits or risks of melatonin in children, caution is required when considering its use in this group. Reports of adverse events suggest that people with epilepsy and those on anticoagulants should carefully consider all other options before taking melatonin.

Review Implications for Research

The effect of melatonin when combined with other jet lag reducing strategies such as light exposure and avoidance should be studied. Interactions of melatonin with caffeine, alcohol, and other drugs such as warfarin should also be assessed to determine its safety and effectiveness under these circumstances.

There are limited data on the effects of melatonin in the elderly and no studies in children. These special populations should be studied to assess the effectiveness of melatonin for general use. More information is also needed on adverse effects of melatonin, as well as its pharmacology and toxicology.

Key Review Components

Search strategy for studies.

MEDLINE, EMBASE, PsychLit, Science Citation Index and the Cochrane Controlled Trials Register

Hand searching of journals - 'Aviation, Space and Environmental Medicine' and 'Sleep': 1986-1999
Content experts for unpublished and additional published studies

Case reports of adverse effects ascribed to melatonin

Selection criteria for studies.

Randomized trials comparing melatonin with placebo or other medication taken before, during and/or after travel.

Participants considered were airline staff, passengers or military personnel.

Outcomes were self-ratings of jet lag and measures of jet lag components (fatigue, daytime tiredness, sleep onset at destination, sleep quality, psychological functioning, duration of return to normal and phase of circadian rhythm measures).

Studies reviewed.

9 trials in civilian travelers were included.

Outcomes.

The included studies assessed different aspects of jet lag.

Melatonin vs. placebo

- 8 out of 9 trials showed reduction in jet lag symptoms.
- Global Visual Analogue Score (VAS) for jet lag¹, based on 5 trials (209 flights²):
WMD³ = -37.35, 95% CI⁴ -39.79 to -34.91
- Numbers needed to treat (NNT) based on 2 trials that reported results for individuals (n=46) = 2

'Post' or 'pre+post'⁵ regimens vs placebo

- Trials comparing the effectiveness of placebo, "pre+post" or "post" melatonin administration reached contradictory conclusions.

Comparison of dosages

- 1 trial comparing 8mg melatonin with 5mg or less found no differences.
- 1 trial comparing 5mg melatonin with 0.5mg, found no difference in fatigue but improved sleep latency and quality with 5mg. Both dosages were more effective than a 2mg slow-release form.

Side effects

- Of the 2 trials that systematically documented side effects, 1 found no difference between placebo and melatonin and 1 found more ear/nose/throat problems with melatonin users.
- Based on 25 case reports, seizures, bleeding and skin rashes are possible adverse effects associated with melatonin.

¹ VAS: 0 = no jet lag and 100 = maximum jet lag

² Excludes a portion of 1 trial that had 18 westward flights

³ Weighted mean difference

⁴ Confidence interval

⁵ Regimen taken after travel

⁶ Regimen taken before and after travel

Source: Herxheimer A, Petire KJ. Melatonin for the prevention and treatment of jet lag: Cochrane Review. *The Cochrane Library*, Issue 1, 2002. This review is maintained and updated in the Cochrane Library. Oxford: Update Software.

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