

Mysterious melatonin

Food supplements with melatonin promise a quick solution for insomnia. However, uncritical use of these products is ill-advised.



When it gets dark in the evenings, the pineal gland begins to produce and release melatonin. The concentration of this hormone in the body then increases over the following hours and peaks at around three in the morning. As daylight increases, the melatonin production is inhibited and melatonin levels slowly decrease again. Through this light-dependent regulation, melatonin, together with other messenger substances, influences our circadian (day-night) rhythm, although melatonin concentrations and time-dependent fluctuations thereof can vary widely between individuals. Additionally, the hormone is involved in a number of other circadian processes, including the regulation of body temperature, blood pressure or the release of other hormones.

PILLS AND POWDERS AS “NIGHTCAPS”

Melatonin’s role as a metronome for the body’s internal clock provides an interesting basis for treating certain sleep problems. In fact, medications with melatonin as the active ingredient are approved for use in Germany for short-term treatment of sleep disturbances. Their use is intended for adults over 55 as well as for children with certain pre-existing medical conditions if other sleep-promoting measures and routines have proven unsuccessful.

Aside from these melatonin-containing prescription medications, melatonin-enriched foods may be found on the market, such as tea, as well as food supplements with melatonin, including capsules, sprays, powders, and even brightly-coloured fruit gummies. These typically contain between 0.5 and 1.5 milligrams (mg) of melatonin per daily dose, although some products have been

found to contain higher doses, e.g. up to 10 mg per dose. Their concentration thus roughly corresponds to that of certain prescription medications (typically around 2 mg per daily dose) and in some cases is actually higher. As of yet, there are no fixed maximum values for the concentration of melatonin in food supplements. Scientists from the German Federal Institute for Risk Assessment (BfR) are critical of the growing number of available food supplements of this type. One concern is that people with sleep issues can purchase these products without a prescription or prior medical consultation. Thus, there is no opportunity to control the duration of usage or potential undesired effects, or to medically investigate underlying reasons for the sleep disturbances. A further concern is that health risks, especially for longer-term use, remain to be studied in detail and well characterised.

SLEEP AID WITH HEALTH RISKS

In the few scientific studies performed with healthy adults, reported undesired effects of melatonin consumption most commonly included headache, lowered attention span, low blood pressure, nightmares, drowsiness in the mornings, and unsteadiness when



WHO SHOULD NOT CONSUME FOOD SUPPLEMENTS WITH MELATONIN?

- infants, children, and adolescents
- women attempting to become pregnant, pregnant and breastfeeding women
- people with autoimmune illnesses or epilepsy as well as people with compromised liver and/or kidney function
- only after consulting a doctor: people taking medications, people at risk for type 2 diabetes
- healthy adults: no unmonitored long-term intake

walking. Following melatonin intake, the ability to drive or perform tasks requiring a high degree of attention can be impaired. Some studies suggest that melatonin may influence the immune system, while others indicate that the hormone can change blood sugar levels. Since melatonin affects other hormones produced by the body, there is an ongoing discussion as to whether intake by children and

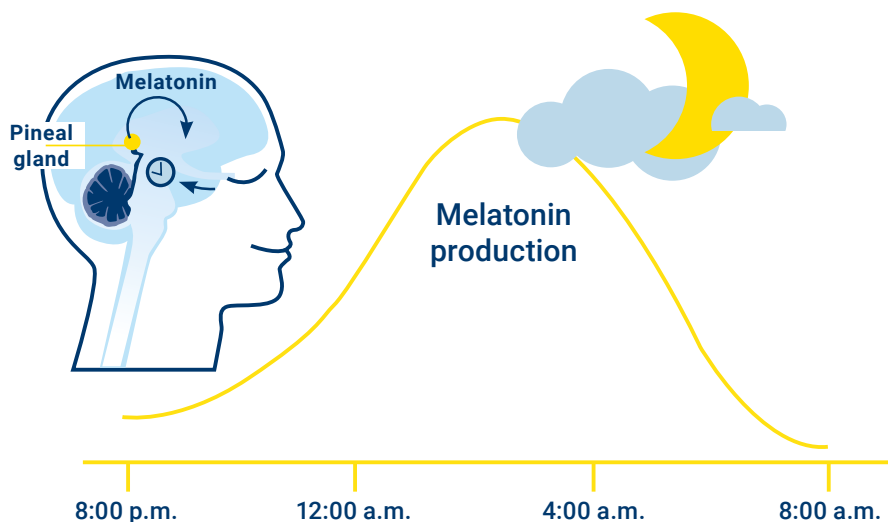
adolescents might impair childhood development, in particular hormonal development during puberty (see interview with Dr Valérie Trendelenburg on page 21).

The extent to which consumed melatonin affects the endogenous, or natural, levels of the hormone in the body varies widely between individuals. Studies have shown that even low doses can lead to melatonin levels in the body which vastly exceed natural levels and may thus potentially negatively impact the body's internal clock. Infants and small children, older people, and people with certain widespread genetic variants of particular enzymes metabolise melatonin more slowly. For these groups, there is a risk of melatonin accumulation, which may lead to higher health risks.

In the opinion of the BfR, for these reasons, adults should not consume food supplements with melatonin uncritically nor in unmonitored amounts, particularly not on a long-term basis. The BfR recommends that some groups of people, for example children or pregnant women, should generally avoid consumption of melatonin-containing food supplements, due to insufficiently studied health risks (see box).

Melatonin and sleep

Melatonin – together with other messenger substances – controls our circadian rhythm.



“The health risks are not well studied”



Melatonin-containing food supplements are also being advertised as sleeping aids for children. According to BfR scientist Dr Valérie Trendelenburg, this is a concerning trend.

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Ms Trendelenburg, why are you critical of giving melatonin to children?

Mainly because the health risks for healthy children and adolescents have not been well studied, especially when it comes to long-term use. In the available studies, the focus tends to be on children with pre-existing medical conditions, often serious ones, and the number of study participants is often very small.

Is there evidence of health risks?

Yes. For children and adolescents with sleep disorders who did not have other serious illnesses, undesirable effects were observed after several days of melatonin intake, including headaches, dizziness, and gastrointestinal problems. Moreover, even small amounts of consumed melatonin can influence other hormones produced in the body. This may have an impact on childhood development, for example on growth/height and pubertal development. We must not forget that melatonin is a hormone. It affects various processes in the body.

And yet, there are products available which seem to be specifically made for children, for example melatonin fruit gummies.

This is concerning, because there is a risk of confusing the gummies with candy, meaning that children might easily consume these products by accident. Moreover, presentation of food supplements in such a form can contribute to an uncritical perception of such products.

What does the BfR recommend?

Based on the current scientific evidence, we recommend not giving children and adolescents melatonin-containing food supplements. Concerned parents who assume that their children have sleep disorders should consult with paediatricians in order to determine the underlying cause.—