Melatonin decreases dramatically with aging compare with the optimal value of the young adult at the age of thirty. It remains only 50% at forty years and then years later the plasma levels are even lower of 75%. At 60 years melatonin level represents 9% of the young adult and there may be no increase in melatonin production at night (1, 2).

The signs of over dosage during melatonin therapy are: tachycardia, sweating events, heavy head in the morning, too vivid dreams, those might be assigned to excess stimulation of the 5’ deiodinase activity which converts T4, the inactive form, into T3 the powerful form of thyroid hormones (3, 4, 5).

Another side effect is a deep prolonged sleepiness the whole night until late in the morning. All those side effects may be solved by reducing melatonin dosage. In case of insufficient daylight exposure during the day (too dark office room or insufficient lighthouse or during autumn and wintertime) melatonin receptor will be less synthesized but also endogenous melatonin secretion at night will be decreased as of an excess of light in bedroom at night may produce the same adverse effects (6, 7, 8, 9, 10). Stress or excess cortisol (11) and adrenaline are responsible for a decrease in melatonin secretion so that melatonin dosage should be increased. Exposure to magnetic fields is associated with decreased nocturnal melatonin levels. Many medicines may interfere with melatonin production (12, 13, 14): B-blocking agents (15, 16), benzodiazepine (17, 18), glucocorticoids, oral contraceptive pill (19), sodium valproate, all those agents decrease melatonin production. Alcohol (20), as tobacco (21, 22) consumption decrease melatonin levels during the night. Caffeine, ingested in the evening at a dose corresponding to two ordinary cups of coffee, augments the nocturnal serum melatonin level, which supports the notion that cytochrome P450(CYP)1A2 is involved in the hepatic metabolism of human melatonin (23).

Melatonin therapy increases T4 conversion into T3 and also growth hormone, DHEA production (24, 25, 26, 27). It has no effect on ovarian function in case of physiological supplementation but may reduce estrogens levels in case of overdosage or prescribed for postmenopausal women (28). Melatonin should be avoided during pregnancy and breast feeding since its teratogenic effect is not known. Patients suffering from autoimmune diseases have been shown to have an imbalance between cortisol and melatonin in favor of this last one (29). Melatonin supplementation may worsen auto-immune disease (30, 31). Melatonin is an immunomodulation agent it alters the balance of leucocyte T helper Th1 and Th2 cells mainly towards Th1 response, although, stimulating the production of natural killer cells, monocytes and leucocytes (32, 33, 34, 35, 36).

References


