



Beauty sleep: Sleep deprivation and the skin

BY LILY TALAKOUB, MD, AND
NAISSAN O. WESLEY, MD

There are many, many, short-term and long-term consequences of sleep deprivation. The most clinically apparent ones – swollen, sunken eyes; dark circles; and pale, dehydrated skin – are obvious. However the sub-clinical consequences are not so obvious. Sleep deprivation affects wound healing, collagen growth, skin hydration, and skin texture. Inflammation is also higher in sleep-deprived patients, causing outbreaks of acne, eczema, psoriasis, and skin allergies.

Sleep deprivation can be caused by artificial light, shift work, sleep disturbances, and social life. Studies have shown that sleep plays a role in restoring the immune system function and that changes in the immune response triggered by high-stress states such as sleep deprivation affect collagen production. Several studies of prolonged sleep deprivation also suggest breaks in skin barrier function. Rats subjected to prolonged periods of sleep loss in a study developed ulcerative lesions on their paws and tails, and susceptibility to bacterial infection.

The reduction of sleep time affects the composition and integrity of the skin. Sleep deprivation increases glucocorticoid production. The elevation of cortisol inhibits fibroblast function and increases matrix metalloproteinases (collagenase, gelatinase). Matrix metalloproteinases accelerate collagen and elastin breakdown, which is essential to skin

integrity, and hastens the aging process by increasing wrinkles, decreasing skin thickness, inhibiting growth factors, and decreasing skin elasticity.

Are there treatments to reverse these signs? Yes. Treatments to help increase skin collagen production include microneedling, radiofrequency devices, fractionated lasers, and topical agents such as retinoids. However, we cannot readily reverse the impact inflammatory processes, skin barrier dysfunction, or the disruption of the skin biome has on our skin. Beauty sleep is both necessary and irreplaceable. ■

References

1. Am J Physiol. 1993 Nov;265(5 Pt 2):R1148-54.
2. Am J Physiol Regul Integr Comp Physiol. 2000 Apr;278(4):R905-16.
3. Am J Physiol Regul Integr Comp Physiol. 2005 Feb;288(2):R374-83.
4. Am J Physiol Regul Integr Comp Physiol. 2007 Jul;293(1):R504-9.
5. Med Hypotheses. 2010 Dec;75(6):535-7.
6. Sleep. 2013 Sep 1;36(9):1355-60.
7. BMJ. 2010 Dec 14;341:c6614.
8. Brain Behav Immun. 2009 Nov;23(8):1089-95.



Dr. Talakoub and Dr. Wesley are co-contributors to this column. Dr. Talakoub is in private practice in McLean, Va. Dr. Wesley practices dermatology in Beverly Hills, Calif. This month's column is by Dr. Talakoub. Write to them at dermnews@frontlinemedcom.com.