

Overlooked effects of ambient lighting on metabolism and cardiovascular disease

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Research has demonstrated that contributing factors to the incidence of cardiovascular events can be extrinsic or intrinsic. Exogenous stimulants include sleep deprivation, volume of caloric intake and ambient room temperature. Endogenous factors, leading to changes in gene expression, include humoral, autonomic and light/dark mechanisms affecting the heart and vasculature. Emerging evidence documents effects on myocardium, measured by numerous risk markers of cardiovascular disease. Many of those risk markers are regulated by the circadian system — endogenously generated, but still susceptible to external stimuli. Alteration of the circadian rhythm by ambient lighting changes will affect sensory input to non-visual retinal pathways, such as the one leading to the suprachiasmatic nucleus, master regulator of circadian functions. Purposeful stimulation of the retino hypothalamic tract and other retinal pathways elicits chemical changes in the optic nerve, triggering quantifiable shifts in metabolic activity in the brain and body, such as melatonin levels. A novel approach to preventive and therapeutic cardiovascular health is the intentional activation of non-visual retinal pathways, by using specific frequencies of ambient lighting during carefully selected times in either home or institutional settings. Future investigation may shed light on possible correlations between light exposure during sleep and arrhythmogenesis or sudden death.

Biography

Deborah Zelinsky, O.D., F.N.O.R.A. is the founder and clinical director of the Mind-Eye Connection, in Northbrook, Illinois, which emphasizes functional systems connected to the eye, beyond traditional vision care. She has patented innovative methods of retinal and corneal stimulation that affects sensory integration and hormonal regulation respectively, and is recognized internationally in her field of neuro-optometric rehabilitation. Adina S. Gutstein, M.S.N., CRNP, FPCNA, is a certified adult nurse practitioner with extensive experience in cardiac care, practicing in Philadelphia, Pennsylvania.