SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

This exploratory study examines the relation between light exposure and circadian rest–activity patterns in infants.

DESIGN IMPLICATIONS

Designers should be aware of the lighting conditions so that they can provide an appropriate environment to facilitate the development of entraining rhythms and sleep–wake cyclicity in infants if this is desired. Further, designers should consider increasing ambient light through the use of natural sunlight or artificial light to supplement daylight illumination as an intervention during the early postnatal weeks. This application might be used in transition units where neonates and parents are preparing to go home following a long hospital stay.

Light is Beneficial for Infant Circadian Entrainment: An Actigraphic Study

Tsai, S., Thomas, K. A., Lentz, M. J., Barnard, K. E.
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Key Concepts/Context

When babies have their days and nights mixed up, it puts stress on the parents, disrupting their sleep, causing fatigue, and even leading to depression. Ambient light regulates the sleep-awake cycle in adults, however, it is less clear what role it plays in developing the circadian rhythms of infants. This paper takes a look at how light is related to infants' circadian rest-activity patterns.

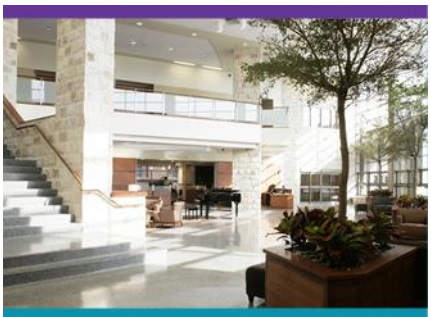
Methods

This intensive within-subject design included a convenience sample of 22 infants who wore a light-and-activity monitoring device for 7 consecutive days at home.

During the 7-day, in-home monitoring, a light-activity actigraphic monitor was placed around the infant's ankle to record activity and illumination exposure. In addition, the mother recorded the infant's sleep–wake times, as well as when the monitor was removed for bathing or when the baby was exposed to external motion such as stroller or career walking. Researchers examined the associations between light exposure and circadian rest–activity rhythm parameters using correlation and regression analyses. Data were collected between 2006 and 2007. All analyses were conducted in SPSS 14.0.

Findings

Infants spent one-eighth of their daytime hours in environments with >100-lux light levels. Researchers found a relatively large statistically significant relation between the peak of light exposure and the peak of activity. The data indicate that increased duration of daily exposure to >100 lux of illumination and increased amplitude of circadian rhythm of light were associated with stronger circadian patterns of infant activity. The study's results indicate an association between light and activity



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patterns. Further, according to these findings, it's possible that exposing infants to moderate light levels may be an easy and inexpensive nursing intervention during the early postnatal weeks to help infants adjust to a more normal circadian rhythm.

Limitations

There are a few limitations to consider when interpreting the study's results. First, this was a natural observation study conducted in the home environment. The researchers did not try to alter the infant's daily feeding and sleep–wake schedules or to manipulate his/her light exposure. Therefore, it is not possible to infer a causal relationship. Second, this study included a small highly selected sample of infants with limited range and low variability in light exposure. A bigger sample size might offer more accurate population estimates of natural-light exposure experiences. Third, because of the naturalistic nature of this study, it is hard to completely dissociate the entraining effect of other social stimuli from that of the light–dark cycle.