Immediate effects of phototherapy on sleep in very preterm neonates: an observational study

ID 3925776
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Year 2016
Title Immediate effects of phototherapy on sleep in very preterm neonates: an observational study
Journal Journal of sleep research
Volume 25
Number 5
Pages / **Article-Number** 517-523
Mesh terms Birth Weight; Female; Gestational Age; Humans; Infant, Extremely Premature, physiology; Infant, Newborn; Movement; Phototherapy; Pregnancy; Respiration; Sleep, radiation effects; Sleep, REM, radiation effects; Ultradian Rhythm, radiation effects; Video Recording; Wakefulness, radiation effects

Process C (internal clock) and Process S (sleep-wake homeostasis) are the basis of sleep-wake regulation. In the last trimester of pregnancy, foetal heart rate is synchronized with the maternal circadian rhythm. At birth, this interaction fails and an ultradian rhythm appears. Light exposure is a strong factor influencing the synchronization of sleep-wake processes. However, little is known about the effects of phototherapy on the sleep rhythm of premature babies. It was hypothesized that sleep in preterm infants would not differ during phototherapy, but that a maturation effect would be seen. Sleep states were studied in 38 infants born <ă32ăweeks gestational age and/or <ă1ă500ăg birth weight. Videos of 3ăh were taken over the first 5ădays of life. Based on breathing and movement patterns, behavioural states were defined as: awake; active sleep; or quiet sleep. Videos with and without phototherapy were compared for amounts of quiet sleep and active states (awakeă+ăactive sleep). No significant association between phototherapy and amount of quiet sleep was found (Pă=ă0.083). Analysis of videos in infants not under phototherapy revealed an increase in time spent awake with increasing gestational age. The current data suggest that the ultradian rhythm of preterm infants seems to be independent of phototherapy, supporting the notion that sleep rhythm in this population is mainly driven by their internal clock.

Publisher WILEY
ISSN/ISBN 1365-2869
edoc-URL https://edoc.unibas.ch/64014/
Full Text on edoc No;
Digital Object Identifier DOI 10.1111/jsr.12408
PubMed ID http://www.ncbi.nlm.nih.gov/pubmed/27140951
ISI-Number WOS:000388457300004
Document type (ISI) Journal Article