Inadequate light exposure during inpatient stay of pregnant women

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Background and aims:

The endocrine system of humans and the internal circadian clock are synchronized by light with the outside world. Although the illuminance is up to 100,000 lux on sunny days, only 200 to 300 lux is reached indoors without artificial lighting. The lighting has a particular role during hospitalization, because the patients stay due to lack of mobility mostly indoors. We evaluated the light exposure of pregnant women during hospitalization.

Methods: 20 patients were included in the study.

The illuminance (lux) and dose of effective circadian irradiation (Hec) (J/m²) were recorded every 10 seconds by light dosimeters (Lucerne University, Switzerland) attached to the patients' clothing.

Figure: Patient rooms in standard lighting condition

Results: We documented the illuminance exposure of 20 pregnant women on 160 inpatient days.

The median (IQR) measured illuminance was

56 (22-124) Lux in the morning (07:00-11:59),

90 (43-174) Lux in the afternoon (12:00-16:59) and

18 (6-53) lux in the evening (17:00-21:29).

Illuminance in the patient room remained 67% of the morning and 54% of the afternoon below the recommended EU standard of 100 lux.

An illuminance exposure above 300 Lux was reached only in 11% of the inpatient time in the morning and 19% in the afternoon.

The median Hec (IQR) was 272 J/m² (83-1003) in the morning and 138 J/m² (37-683) in the afternoon (morning vs. afternoon, $p < 0.001$). Hec values were > 8000 J/m² in three control patients, who stayed at least 1 h under natural daylight conditions)

Conclusion:

Our study presents the first information about the lighting status of pregnant women during inpatient stays.

Their exposure to light is significantly lower than natural daylight levels and also below the recommended EU standard.