

Publication

Dynamics and complexity of body temperature in preterm infants nursed in incubators

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Poor control of body temperature is associated with mortality and major morbidity in preterm infants. We aimed to quantify its dynamics and complexity to evaluate whether indices from fluctuation analyses of temperature time series obtained within the first five days of life are associated with gestational age (GA) and body size at birth, and presence and severity of typical comorbidities of preterm birth.; We recorded 3h-time series of body temperature using a skin electrode in incubator-nursed preterm infants. We calculated mean and coefficient of variation of body temperature, scaling exponent alpha (Talphi) derived from detrended fluctuation analysis, and sample entropy (TSampEn) of temperature fluctuations. Data were analysed by multilevel multivariable linear regression.; Data of satisfactory technical quality were obtained from 285/357 measurements (80%) in 73/90 infants (81%) with a mean (range) GA of 30.1 (24.0-34.0) weeks. We found a positive association of Talphi with increasing levels of respiratory support after adjusting for GA and birth weight z-score ($p < 0.001$; $R^2 = 0.38$).; Dynamics and complexity of body temperature in incubator-nursed preterm infants show considerable associations with GA and respiratory morbidity. Talphi may be a useful marker of autonomic maturity and severity of disease in preterm infants.

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