A33 - Chronobiological and recurrence quantification analysis of temperature rhythmicity in critically ill patients.

V Papaioannou 1; E Sertaridou 1; I Chouvarda 2; I Pneumatikos 1

1University Hospital of Alexandroupolis, Intensive Care Unit, Alexandroupolis, Greece, 2Aristotle University of Thessaloniki, Faculty of Medicine, Thessaloniki, Greece

Introduction:
Rhythmicity and complexity of several circadian biomarkers, such as melatonin, cortisol and temperature have been found to be modified by critical illness.

Methods:
We examined the potential alterations of Core Body Temperature (CBT) fluctuations and complexity in three groups (N=21): patients with septic shock upon ICU admission (Group A, N=10), patients who developed septic shock at ICU hospitalization (Group B, N= 6) and controls (Group C, N=5). The hourly, average CBT was computed for 24 h upon ICU admission and discharge in Groups A and C, as well as during septic shock onset in Group B. Cosinor analysis of CBT curves was performed leading to the estimation of mesor (mean value), amplitude (the difference between peak and mean values) and acrophase (phase shift of maximum values in hours). Complexity of CBT signals was evaluated with Recurrence Quantification Analysis (RQA).

Results:
No significant alterations in any circadian feature within groups were found, except for amplitude. Controls excibeted increased entry CBT amplitude (0.45 ± 0.19) compared to Groups A (0.28 ± 0.18, p < 0.05) and B (0.32 ± 0.13, p < 0.05). Higher entry CBT amplitude in Groups B and C was related with lower SAPS II (r = -0.72 and -0.84, p < 0.003) and APACHE II scores (r = -0.70 and -0.6, p < 0.003) respectively, reduced ICU and hospital stay in Group B (r = -0.62 and -0.64, p < 0.003) and entry SOFA score in Group C (r = -0.82, p < 0.003). Recovery CBT time series appeared more periodic in relation with ICU entry, for all groups. A more random CBT signals pattern upon admission was related with higher severity of illness and extension of ICU stay for all groups.

Conclusion:
Reduced CBT fluctuations upon ICU admission was found to more severely ill patients with worse clinical outcomes, while the more periodic CBT patterns were correlated with high CBT rhythmicity and better outcome.