

# CIRCADIAN SYSTEM STATUS AND SLEEP IN WOMEN WITH LOCALIZED BREAST CANCER UNDER CHEMOTHERAPY TREATMENT.

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## BACKGROUND

Sleep disorders are highly prevalent in cancer patients (up to 60%) and commonly associated with circadian disruption, with a variety of manifestations such as alterations in the regularity or relative amplitude of the rhythms, or in the sleep timing or duration (1). Sleep and circadian alterations increase fatigue and other symptoms common in cancer like anxiety or depression, deteriorating the patient's life quality. Further, these alterations are known to negatively impact the immune response, potentially affecting treatment efficacy and survival.

Ambulatory Circadian Monitoring (ACM) allows noninvasive assessment of circadian functioning and sleep under normal living conditions, which provides valuable information relevant to general health status, and helps personalizing the therapeutic approach from habits modification and chronopotentialization (2).

## METHODS

48 localized breast cancer patients (50.4±7.7 years, 23.3±3.4 BMI, L-BCP), attended at the Oncology Unit of Hospital Universitario Puerta de Hierro-Majadahonda, were asked to wear a watch-like device (Kronowise®) during 7 consecutive days in free-living conditions. It recorded 15 raw variables yielding measures of motor activity (time in movement and acceleration), wrist skin temperature, light exposure, and position variability, which were used to estimate sleep through the TAP-Keywake® algorithm implemented in the Kronowizard platform (<https://kronowizard.um.es/>, UM). Each patient was coupled to a digital twin with the same gender, approximate age, height and weight, recruited among free-of-cancer individuals from a general population, and circadian and sleep parameters were compared between groups through paired T-tests.



Ambulatory circadian monitoring device Kronowise® (Kronohealth SL, Spain).

## RESULTS

L-BCP rhythms were more irregular and delayed, and showed lower relative amplitude and robustness than those of the control group. Besides, the graphic representation of their mean circadian rhythms showed lower daytime activation (TAPL) and more naps in L-BCP, so as an “aged” circadian pattern of temperature, with minimum values in the morning and a progressive increase (which normally indicates physiological deactivation) throughout the rest of the day, which was not matched (and therefore could not be accounted) by a decrease in motor activity.

In general, L-BCP showed worse indicators of circadian health. Taken together, these results confirmed the disruption of circadian rhythms in cancer patients compared with digital control twins.

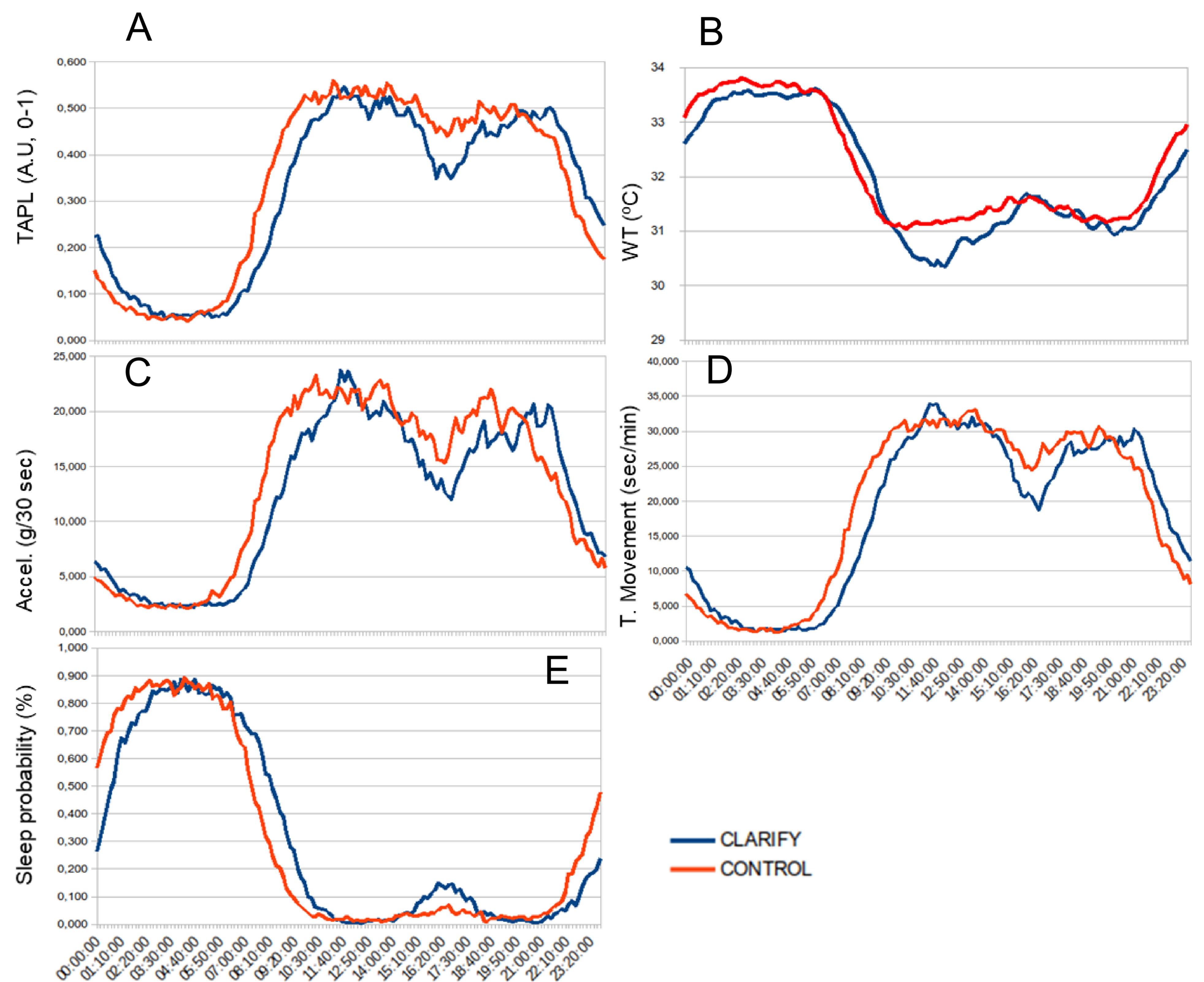


Figure 1. Mean-waveforms for localized breast cancer patients under chemotherapy treatment (L-BCP) (blue line, n=48) and controls subjects (red line, n=48) for: (A) the integrated variable TAPL; (B) distal skin temperature, WT; (C) acceleration of movement; (D) time of movement; and (E) Sleep.

## REFERENCES

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## ACKNOWLEDGMENTS

P.F. A-P was awarded by a Ramon y Cajal fellowship (RYC2020-028642-I), by a grant from Robles Chillida Foundation (N° 38004) and by the MCIN/AEI /10.13039/501100011033 cofunded by 'ESF Investing in your future'. This work was supported in part by CLARIFY project, within European Union's Horizon 2020 Research and Innovation Programme under grant agreement No. 875160, Instituto de Fomento de la Región de Murcia (INFO) and the Instituto de Salud Carlos III through CIBERFES (CB16/10/00239) all co-financed by FEDER.

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