INTRODUCTION

- Physiological systems exhibit rhythmic changes over the course of 24h - Circadian Rhythms.
- Aging and neurological diseases have an increased likelihood of circadian disruption.
- Balance and gait exhibit diurnal variations.
- Gait is characterized by stride-to-stride fluctuations.
- A breakdown in the temporal structure of these fluctuations has been associated with aging and neurological diseases.
- Circadian disruption may affect the stride-to-stride fluctuations over a 24h period.

The present study aims:

1) to investigate how stride-to-stride fluctuations vary throughout a day;
2) to examine the effects of chronotype in stride-to-stride fluctuations.

METHODS

Subjects:
- Three male participants (28.3±3.89yrs)

Data Collection:
- Chronotype (Morningness-Eveningness Questionnaire).
- 15min overground walking trials at 2h intervals (8am – 8pm), wearing insoles footswitches.

Data Analysis:
- Stride time was determined and we have calculated:
  - Mean.
  - Fractal scaling (i.e. temporal structure) was calculated through DFA.

RESULTS & DISCUSSION

- A certain cycle emerges for daily fluctuations of the fractal scaling of the stride-to-stride fluctuations. (Fig 1, upper panel)
- Consistency of the linear measures of stride time throughout the day (Fig 1, lower panel)

CONCLUSIONS

- Individuals with different chronotypes seem to present a specific pattern of gait variability
- Stride-to-stride fluctuations in gait are likely to be influenced by circadian rhythms.
- New insights of a potential increased risk of falling in older adults at specific times of the day that can be targeted of interventions.

REFERENCES


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