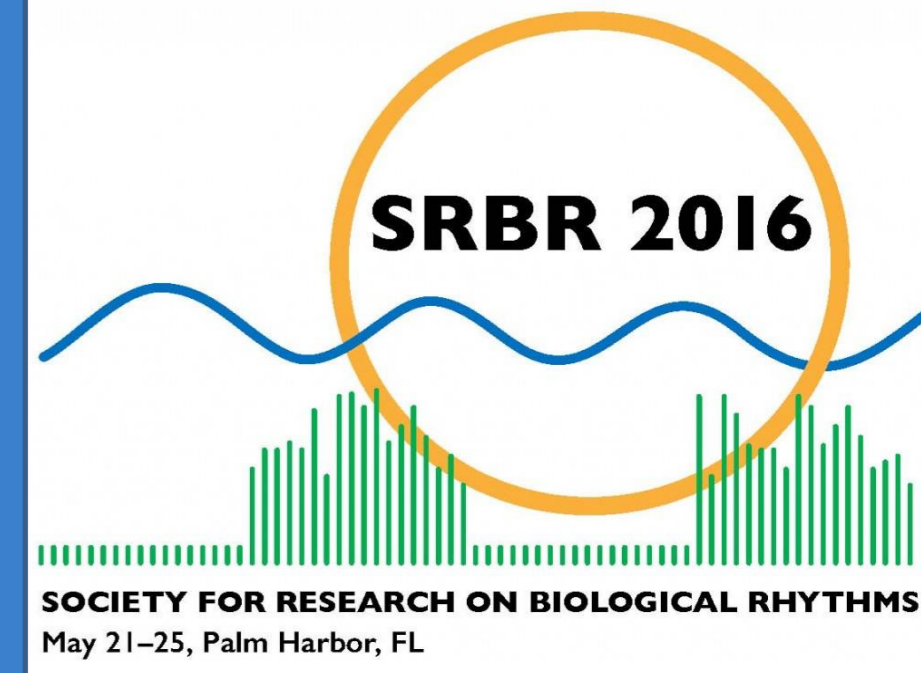


Phase-angle differences between dim-light melatonin onset (DLMO) and sleep onset in patients diagnosed with Delayed Sleep Phase Syndrome



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INTRODUCTION

- Delayed Sleep Phase Syndrome (DSPS) is an intrinsic circadian rhythm disorder characterized primarily by sleep-onset insomnia when attempting to adhere to a desired, “normal” bedtime and extreme difficulty arising at a desired “normal” wake-up time¹.
- In current literature, the majority of the population shows a dim-light melatonin onset (DLMO) around 10pm and a phase angle difference to sleep onset of approximately 2h¹.
- Until now no study has investigated the phase angle difference between these values for extreme evening types, namely patients diagnosed with DSPS.
- The aim of this study was to Investigate the phase angle difference between DLMO and sleep onset for extreme evening types.

SUBJECTS

Delayed Sleep Phase Syndrome (ICSD3)² database (n=220) (CENC - Sleep Medicine Center)

➔ **79 patients** ➤ Sleep diary
 ➤ DLMO³



RESULTS

Table 1
 Sample Characteristics; mean ± standard deviation. Different lowercase letters represent significant differences between groups for each variable (Bonferroni test, p < 0.05)

	Age	Wake up time (diary)	Sleep onset (diary)	TST	DLMO	DLMO-Sleep onset (Phase angle)
G1 (DLMO < 00am) n=17	37.4 ± 16.2	11:22 ± 2:42 ^a	3:36 ± 1:14 ^{a,b}	7:40 ± 2:13	22:49 ± 0:42 ^a	4:46 ± 1:19 ^a
G2 (DLMO 00-2am) n=26	38.5 ± 17.3	8:48 ± 1:33 ^b	2:20 ± 1:10 ^a	6:30 ± 1:19	00:48 ± 0:32 ^b	1:33 ± 1:12 ^c
G3 (DLMO > 2am) n=36	38.5 ± 14.1	10:48 ± 2:10 ^c	3:34 ± 1:58 ^b	7:11 ± 2:08	3:25 ± 1:05 ^c	0:08 ± 2:02 ^b
G4 (Healthy) n=9	40.4 ± 3.4	8:21 ± 0:32 ^b	23:59 ± 0:31 ^c	8:24 ± 0:49	22:21 ± 1:03 ^a	1:41 ± 1:07 ^{b,c}

- G1 showed late sleeping schedules but showed a DLMO close to the controls. We therefore considered them a “behavioural evening group” (Table 1).
- G3 showed the latest DLMO and the least phase angle difference, therefore called “sleep phase delay” (Table 1).
- The phase angle difference was only similar between G2 and the healthy group (Figure 1 c).
- For the extreme sleep onset groups (G1, G3), there were statistically significant differences in DLMO and sleep onset phase angle (Table 1).

- G2 showed wakeup times close to the ones from the Healthy group (G4), despite their lowest TST (Figure 1 a,b *). It is possible that this is an outcome of social jet lag, resulting from obligatory wake-up times.

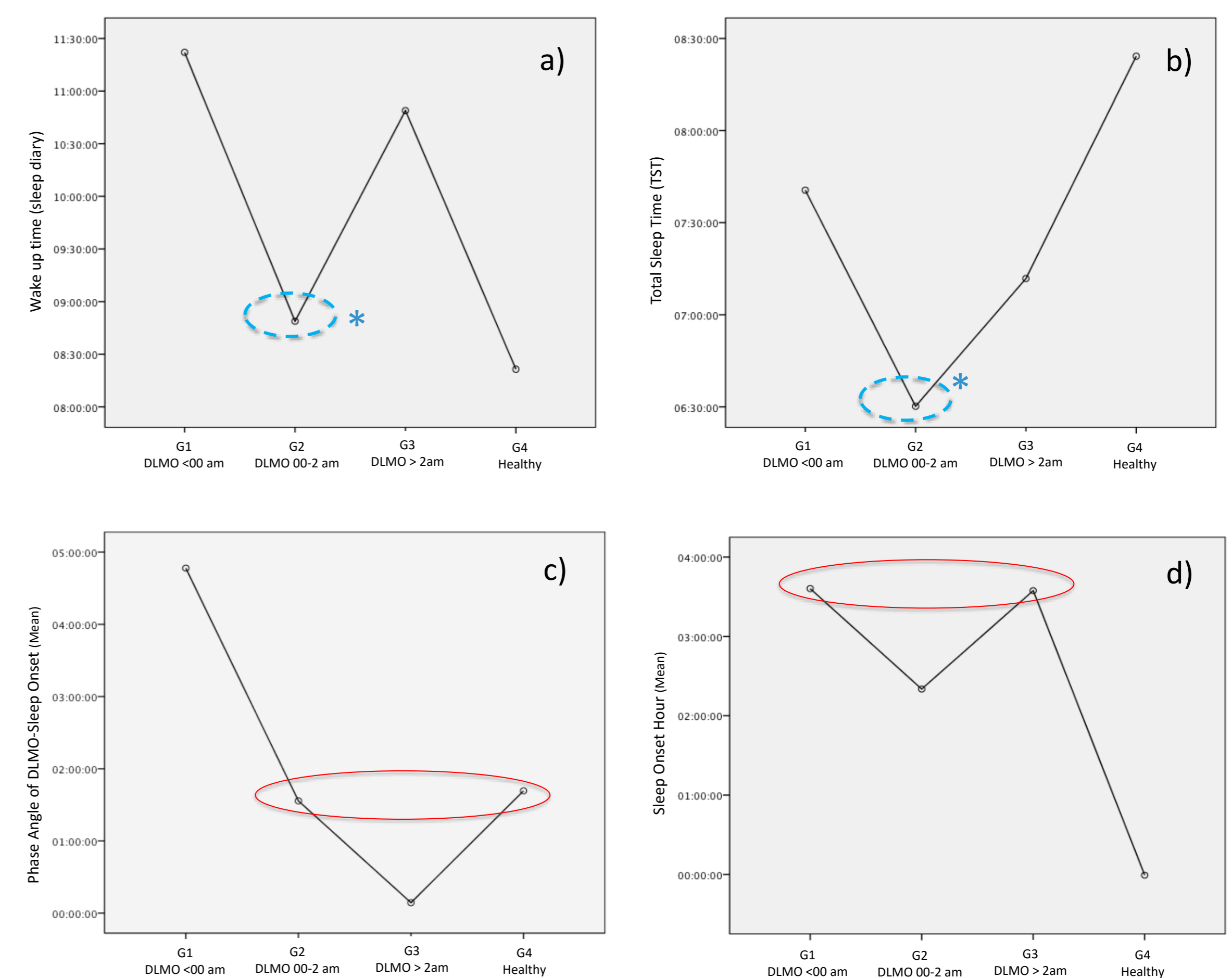


Figure 1
 Mean values for Phase Angle differences between DLMO and sleep onset, sleep onset hour, wake up and total sleep time for the study groups

CONCLUSIONS

- This study enhances the importance of DLMO measurement for therapeutically intervention, suggesting the sleep diary as a poor indicator of circadian phase in DSPD patients.
- Melatonin DLMO does not explain all late bedtimes.
- Diagnosis should be complemented by objective sleep onset measures, such as actimetry or polysomnography.

REFERENCES

- (1) Wyatt J (2004). Delayed Sleep Phase Syndrome. Sleep. 27 (6); 1195- 1203.
- (2) ICSD3 - International Classification of Sleep Disorders, AASM 2014;
- (3) Keijzer H, et al. (2011). Evaluation of salivary melatonin measurement for Dim Light Melatonin Onset calculations in patients with possible sleep-wake rhythm disorders. Clinica Chimica Acta. 412: 1616-1620.



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