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Background

Sleep disturbances were found in euthymic states of patients with bipolar disorder (BD), as well as in individuals at familial/clinical risk for BD development (Melo et al., 2016, Alloy et al., 2017). Sleep and rest-activity circadian rhythms are supposed to be candidate endophenotypes for bipolar disorder (Murray et al., 2010). We analyzed sleep-wake cycle parameters and sleep macrostructure of high-risk for bipolar disorder children under age of 10 years (HR-BD) and age/sex-matched controls.

Methods

19 HR-BD under age of 10 years were recruited from families in which at least one parent was diagnosed with BD. The control group consisted of 17 participants. Sleep was measured by actigraphy (MotionWatch 8) over the course of 30 days. Sleep diaries were collected by parents. Sleep macrostructure characteristics were analyzed separately for freedays (Fri-Sat) and schooldays (Sun-Thr). Psychopathology was assessed by the Kiddie Schedule for Affective Disorders and Schizophrenia and by subjective scales. Group differences were analyzed using T-test or Mann-Whitney U-test as appropriate.

Results

HR-BD had shorter actual sleep time in workdays (t=-2.46, p=0.019) and freedays (t=-3.09, p=0.004), lower sleep efficiency (U=96, p=0.039) in freedays, lower intra-daily variability (t=-2.82, p=0.008), shorter social jet lag (U=77, p=0.007) and shorter social Jet lag corrected for sleep deprivation (U=84, p=0.015) (see tab. 1, 2). No other differences between HR-BD and controls were found.

Table 1. Analysis of sleep wake cycle

	HR-BD (N=19)	Controls (N=17)	p
Relative Amplitude	0,96	0,97	0,235
Intra-daily Variability	0,59	0,73	0,008
Interdaily Stability	329	266	0,286

Table 2. Analysis of sleep macrostructure

	t / U - value	p-value	
Actual sleep time (workdays)	-2,46 (t)	0,019	HR-BD < CONTROLS
Actual sleep time (freedays)	-3,09 (t)	0,004	HR-BD < CONTROLS
Fragmentation Index (workdays)	1,69 (t)	0,099	
Fragmentation Index (freedays)	1,25 (t)	0,218	
Sleep efficiency (%; workdays)	110 (U)	0,106	
Sleep efficiency (%; freedays)	96 (U)	0,039	HR-BD < CONTROLS
Sleep latency (workdays)	125 (U)	0,254	
Sleep latency (freedays)	148 (U)	0,68

Fig 1.- Actigraphic data preprocessing in MotionWare
Sleep period (pink), missing data (grey), light measurement (yellow).
Activity measured in 30s epochs is visualized as black bars.

Conclusions

We found differences in the sleep-wake cycle as well as in sleep macrostructure between high-risk for bipolar disorder children and age/sex-matched controls. Differences were present before occurrence of affective symptoms, what could raise the possibility of sleep abnormalities as an endophenotype of bipolar disorder.

Literature

Melo MC, Garcia RF, Linhares Neto VB, Sá MB, de Mesquita LM, de Araújo CF, de Bruin VM. 2016. Sleep and circadian alterations in people at risk for bipolar disorder: A systematic review. J Psychiatr Res. 83:211-219.

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