

Sleep study with actigraphy in patients affected by cirrhosis with and without minimal hepatic encephalopathy

Cristina Ipiens¹, Juan José Gallego², Alessandra Fiorillo², Franc Casanova², María Pilar Ballester², Rut Victorio³, Dalia Rega², Mika Aiko³, Nicolás Peñaranda³, Carla Gimenez-Garzo⁴, Desamparados Escudero-García⁵, Joan Tosca⁵, Paula Cases³, Amparo Urios², Vicente Felipo⁴, Carmina Montoliu^{2,6}

1.Hospital Universitario de La Ribera, Valencia, Spain., 2.Fundación Investigación Hospital Clínico de Valencia. Instituto de Investigación Sanitaria-INCLIVA, Valencia, Spain, 3.Servicio de Neurofisiología, Hospital Clínico Universitario de Valencia, Spain, 4.Laboratorio de Neurobiología. Centro Investigación Príncipe Felipe. Valencia, Spain , 5.Servicio de Medicina Digestiva, Hospital Clínico Universitario de Valencia, Spain, 6.Departamento de Patología, Facultad de Medicina, Universidad de Valencia, Spain



INTRODUCTION

Sleep disorders are frequently associated with hepatic encephalopathy (HE) and might be some of its first clinical findings, observable even in minimal hepatic encephalopathy (MHE). They are also common in patients with cirrhosis and other liver conditions without defining signs of HE.

Currently, polysomnography is the gold standard for sleep studies, but requires a high consumption of hospital resources and the recording is usually only one night long. Actigraphy devices offer the chance of making longer ambulatory studies.

AIM

The aim of this study was to characterize the sleep-wake patterns in cirrhotic patients and healthy controls, as well as to assess whether sleep alterations are associated to MHE

METHOD

An analytical, observational cohort study was performed to analyze the macrostructure of sleep and the wake-sleep cycle using an actigraphy record for 14 days.

Sixty-eight participants from Hospital Clínico Universitario de Valencia (Spain), grouped into three categories: cirrhotic patients with or without MHE (diagnosed by PHES score) and healthy control subjects.

We estimated the sleep-wake patterns from periods of activity and inactivity reflected by the movements of the patient.

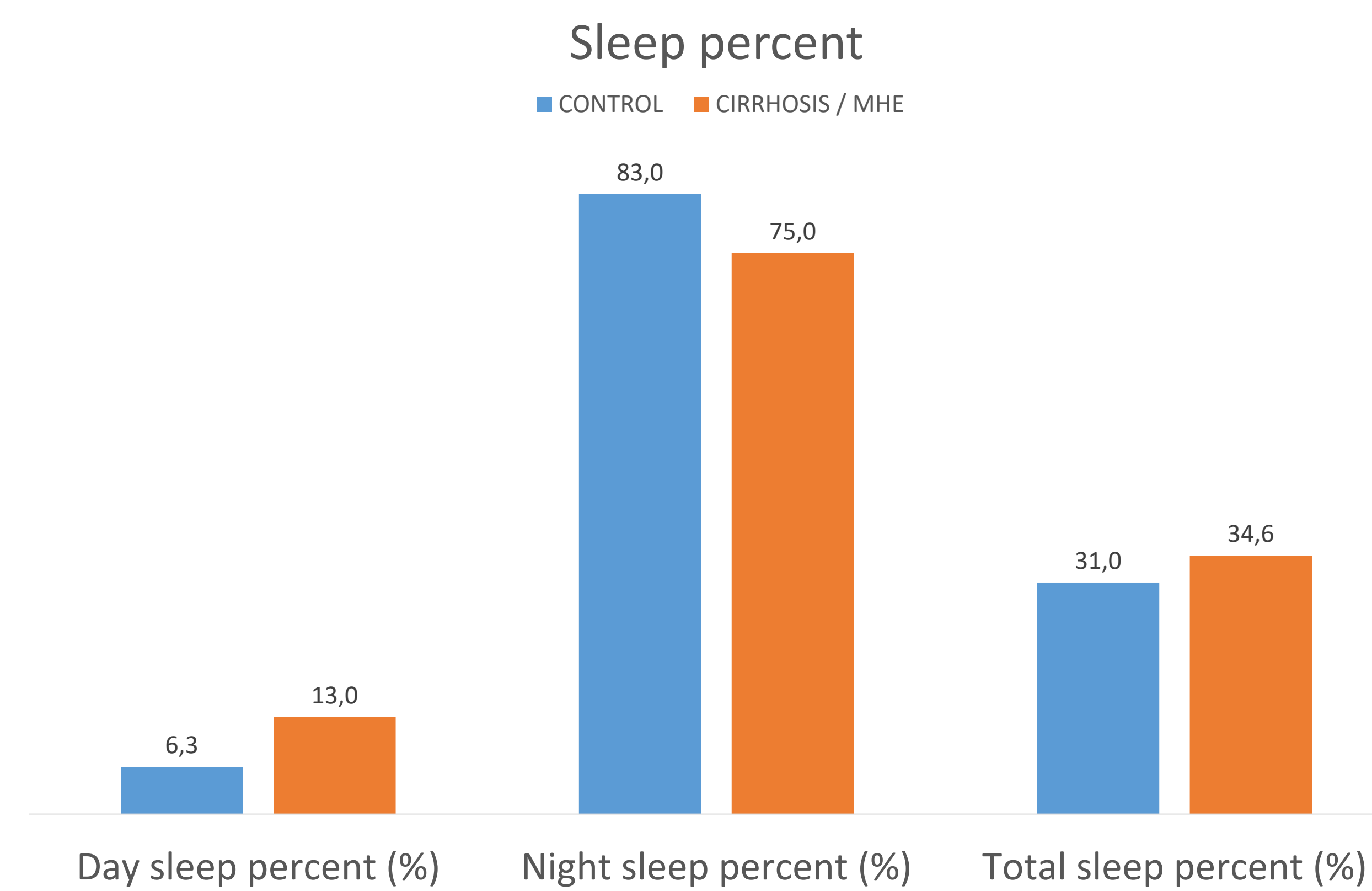
Differences between these three groups were analyzed in terms of time in bed, sleep latency, percentage of sleep, interleaved arousals, and sleep fragmentation index, as well as time in bed and sleep of the patient during the day.

RESULTS

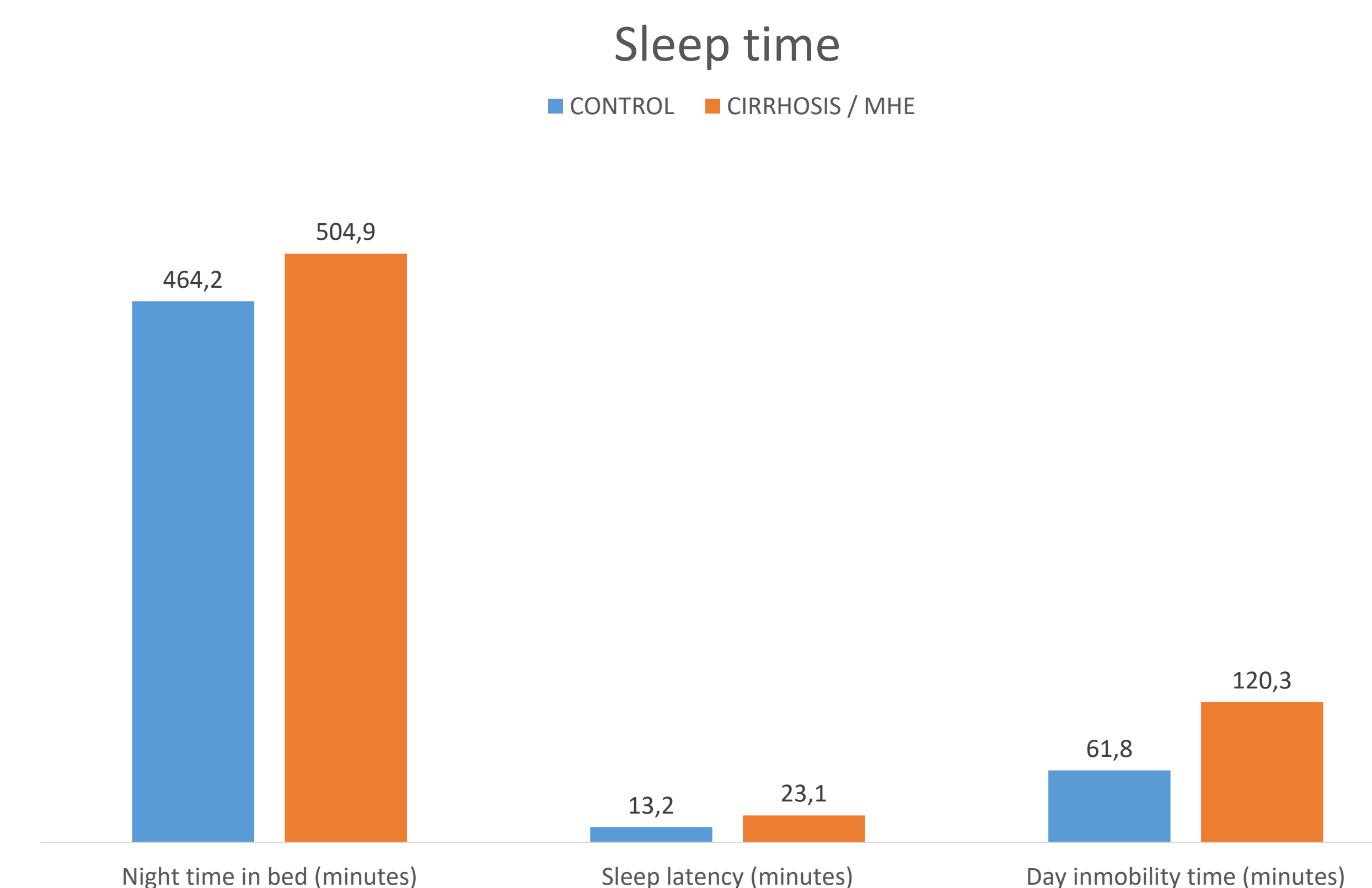
During the night, patients with pathology, either with cirrhosis or with cirrhosis with MHE, stay longer in bed, have a higher sleep latency, a higher sleep fragmentation index and a lower percentage of sleep, which generally represents a worse quality of night rest.

This aspect may be related to the greater immobility and frequent drowsiness that is shown in the daytime record. It is also observed that patients with cirrhosis, with or without MHE, have a significantly higher risk of presenting greater sleep fragmentation, and a risk close to the statistical significance of presenting a longer sleep time during the day.

	CONTROL			CIRRHOSIS / MHE			Statistics
	Mean	95%CI lower	95%CI upper	Mean	95%CI lower	95%CI upper	
Night time in bed (minutes)	464,2	439,2	489,2	504,9	483,1	526,7	0,028
Sleep latency (minutes)	13,2	9,0	17,4	23,1	18,2	28,1	0,003
Night sleep percent (%)	83,0	80,9	85,1	75,0	72,5	77,5	0,000
Fragmentation index (%)	30,0	26,2	33,7	41,3	37,6	45,0	0,000
Day inactivity time (minutes)	61,8	31,5	92,1	120,3	94,2	146,4	0,009
Day sleep percent (%)	6,3	3,3	9,3	13,0	10,1	15,9	0,007
Night sleep percent (%)	83,0	80,9	85,0	75,0	72,5	77,6	0,000
Total sleep percent (%)	31,0	28,5	33,4	34,6	32,0	37,2	0,042



Graphics with sleep percent during the day, night and total.
Percents are calculated with the time of immobility and the time of daylight and time.



Graphics with sleep time in minutes during night and day.
Sleep latency is shown, estimated with minutes of mobility during night period.

CONCLUSIONS

Patients with liver disease might present sleep disturbances which could be the first clinical manifestation in the neurological sphere.

This has been observed both in patients with diagnosed MHE and cirrhosis without MHE, which suggests that patients with cirrhosis might present subclinical neurological alterations.

The actigraphy record proves to be a useful tool for the diagnosis, while it is a test that stimulates its ambulatory use, consumes few professional resources, and allows a prolonged record while respecting the daily life of patients.

ACKNOWLEDGEMENTS

We would like to express our gratitude and appreciation for all participants that took part in the study enabled this research to be possible.

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FUNDING

FISPI18/00150 ISCIII co-funded by FEDER; Fundación Ramón Areces, and Consellería Educación Generalitat Valenciana (PROMETEOII/2018/051)

CONTACT INFORMATION

C. Montoliu: cmontoliu@incliva.es; C. Ipiens: Ipiens_cri@gva.es