

Reduced actual sleep and sleep efficiency in patients on in-centre nocturnal haemodialysis.

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Objective measures:

- **Motionwatch:**



- Assumed sleep: time between falling asleep and waking up.
- Actual sleep: total time effectively spent in sleep.
- Sleep efficiency: actual sleep as a % of time in bed.
- Fragmentation index: an indication of the degree of fragmentation of the sleep period. Can be used as a measure for sleep quality.

Methods

Subjective measures:

- Insomnia Severity Index (ISI): subjective sleep experience of the last 2 weeks.
- Pittsburgh Sleep Quality (PSQI): sleep habits of the past month

Results

Conclusion

Registration time

➤ Daytime HD patients:



Conversion to weekly basis

$$\rightarrow (3 \times \text{Night 1} + 4 \times \text{Night 2}) / 7$$

➤ Nocturnal HD patients:



$$\rightarrow (3 \times (\text{Night 1} + \text{Night 3}) / 2 + 4 \times \text{Night 2}) / 7$$

Quantify sleep in daytime and nocturnal HD patients using objective and subjective measurements.

Differences between subsequent nights in daytime HD patients and nocturnal HD patients

Daytime HD patients			
	Night 1	Night 2	P-value
Sleep efficiency (%)	85 ± 7	86 ± 10	0.851
Assumed sleep (h:min)	8:42 ± 1:59	7:44 ± 1:48	<0.001
Actual sleep (h:min)	7:27 ± 1:43	6:42 ± 1:30	<0.001
Nocturnal HD patients			
	Night 1	Night 2	P-value
Sleep efficiency (%)	80 ± 22	81 ± 13	0.037
Assumed sleep (h:min)	5:53 ± 1:32	7:33 ± 1:35	0.025
Actual sleep (h:min)	4:51 ± 1:48	6:24 ± 1:35	0.029

Differences in sleep patterns between daytime HD patients and nocturnal HD patients

	Daytime HD	Nocturnal HD
Objective parameters on weekly basis		
Sleep efficiency (%)	82.1 ± 11.1	78.0 ± 14.3
Assumed sleep time(h:m)	8:07 ± 1:39	7:04 ± 1:05*
Actual sleep time (h:m)	6:55 ± 1:29	5:56 ± 1:12*
Fragmentation index	43.3 ± 18.3	39.7 ± 22.6
Subjective parameters		
ISI	8.0 ± 5.4	6.9 ± 3.9
PSQI	6.1 ± 3.3	6.0 ± 2.3

* P < 0.05 versus daytime HD

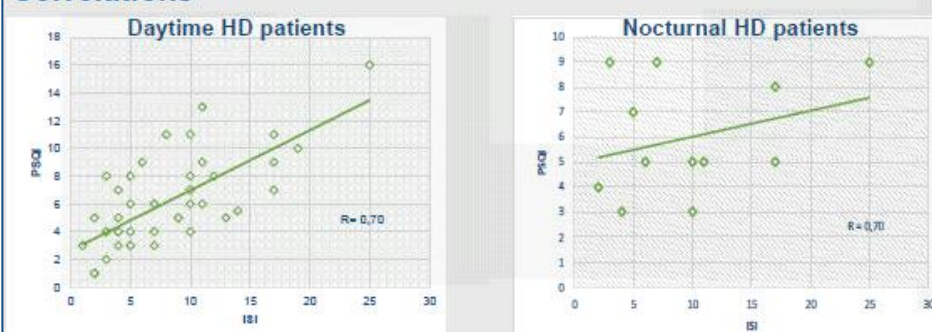
- Patients in the daytime HD group: sleep time is significantly shorter the night before dialysis.
- Sleep quality and sleep efficiency is related to sleeping in hospital during dialysis treatment.
- On a weekly basis nocturnal HD patients scored significantly worse on assumed sleep time and actual sleep time.

Methods

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Correlations



- Correlation between ISI and PSQI: significant in the daytime and nocturnal group.
- No significant correlation between objective and subjective measurements

Methods

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Conclusion



- Sleep time in **daytime HD patients** is less the night before the treatment.
- Sleep quality and sleep efficiency in **nocturnal HD patients** is worse during HD treatment compared to sleeping at home.
- **Nocturnal HD patients sleep less and less efficient as compared to daytime HD patients.**
- **Objective and subjective measurements are not correlated.**



- Patients' perception might deviate significantly from what is measured.
- Further studies preferably include both measurement to have a complete picture of the sleep.