

Impact of sleep characteristics on quality of life of patients with multiple sclerosis.



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Background

Sleep disorders are highly prevalent in Multiple Sclerosis (MS), one third of patient assume sleep medication 2-3 time/week and 50% report sleep problems. Therefore refining the sleep characteristics in terms of quantity and quality is a relevant topic in MS.

Aims

To evaluate the characteristics of MS patients and their impact on health related quality of life.

Materials and methods

A group of MS patients and a matched control group (HC) were enrolled. Sleep quantity and quality were evaluated by actigraphy. Participants wore an accelerometer (Actigraph GTX3+) on the non-dominant wrist over seven consecutive days. Sleep was scored using the Cole-Kripke algorithm. Output parameters were: total sleep time (TST), sleep latency (SLAT: time from when “the lights were turned off” to the onset of sleep), sleep efficiency (SEFF: number of sleep minutes divided by number of minutes in bed), sleep fragmentation index (SFI: total number of <1minute sleep divided by the number of sleep bouts), wake after sleep onset (WASO: defined as number of minutes awake between sleep and “lights on”) and number of awakenings (NOA). Other aspects evaluated were the health-related quality of life assessed by the 5-level EuroQol 5, fatigue assessed by MFIS, physical activity assessed by IPAQ and daily step count, disability assessed by EDSS and twelve item walking scale MSWS-12.

Differences between sleep parameters of MS patients and HC were evaluated by T test for independent samples.

Relationship between sleep parameters, disability, quality of life and physical activity were evaluated by means of Pearson correlation.

Results

A sample of 39 patient (14 male, 25 female ,mean age 46.6 (SD±11.3), mean EDSS 2.8 (SD±2.0))and 43 HC (19 male, 24 female mean age 47.3 (SD±12.9)) was enrolled.

TST differ between MS and HC (p=0,016), when considering the 17 MS patient with EDSS >2,5 also NOA differs with respect to the HC (p=0.002).

The Pearson correlation showed a relationship between WASO (r=0.309 p=0.05), SFI (r= 0.381 p=0.017), NOA (r=0.380 p=0.017) and 5-level EuroQol 5. When considering patient with EDSS>2,5 TST (r=0.545 p=0.02) and SFI (r=0.491 p=0.04) were also related to the EDSS.

| | Efficiency | Total Minutes in Bed | Total Sleep Time TST | Wake After Sleep Onset WASO | Number of Awakenings NOA | Average Awakening Length | Sleep Fragmentation Index | Movement Index | Fragmentation Index |
|---------|------------|----------------------|----------------------|-----------------------------|--------------------------|--------------------------|---------------------------|----------------|---------------------|
| P value | 0.632 | 0.017 | 0.016 | 0.744 | 0.202 | 0.977 | 0.833 | 0.677 | 0.989 |

T test between sleep parameters of 39 MS and 43 HC

| | Total Minutes in Bed | Wake After Sleep Onset WASO | Number of Awakenings | Average Awakening Length | Sleep Fragmentation Index | Movement Index | Fragmentation Index |
|---------|----------------------|-----------------------------|----------------------|--------------------------|---------------------------|----------------|---------------------|
| P value | 0,049 | 0,243 | 0,028 | 0,496 | 0,53 | 0,207 | 0,963 |

T test between sleep parameters of MS patients with EDSS>2.5 and 43 HC

| | Total Minutes in Bed | | Total Sleep Time TST | | Wake After Sleep Onset WASO | | Number of Awakenings | | Average Awakening Length | | Sleep Fragmentation Index | | Movement Index | | Fragmentation Index | |
|------|----------------------|---------|----------------------|---------|-----------------------------|---------|----------------------|---------|--------------------------|---------|---------------------------|---------|----------------|---------|---------------------|---------|
| | Rho | p value | Rho | p value | Rho | p value | Rho | p value | Rho | p value | Rho | p value | Rho | p value | Rho | p value |
| EQ5D | 0.197 | ,229 | 0.151 | ,360 | 0.309 | ,049 | 0.381 | ,017 | -0.147 | 0.371 | ,380 | ,017 | ,300 | ,063 | ,333 | ,038 |

Pearson correlation between quality of life and sleep parameters

Conclusion

Overall our data point out that MS patient sleep less than HC. Moreover sleep quality decreases when considering patient with higher disability. Even in our sample mostly composed by patients with mild/low disability sleep quality moderately impact the perceived quality of life.