

Figure 2: An epoch of diagnostic polysomnogram showing delta sleep.

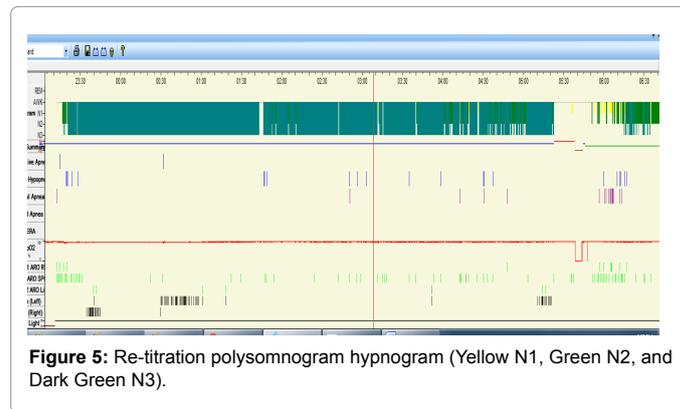


Figure 5: Re-titration polysomnogram hypnogram (Yellow N1, Green N2, and Dark Green N3).

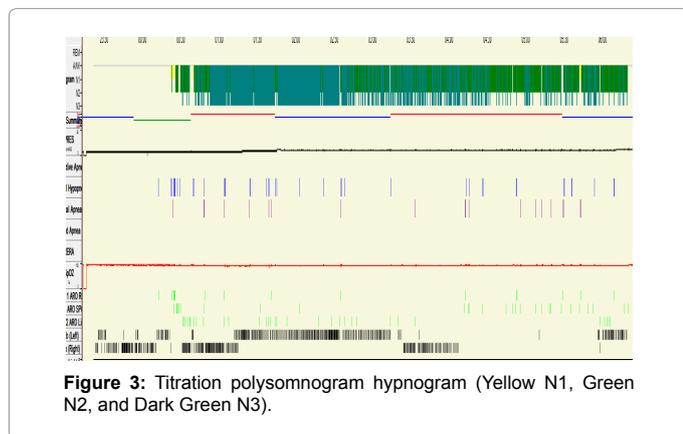


Figure 3: Titration polysomnogram hypnogram (Yellow N1, Green N2, and Dark Green N3).

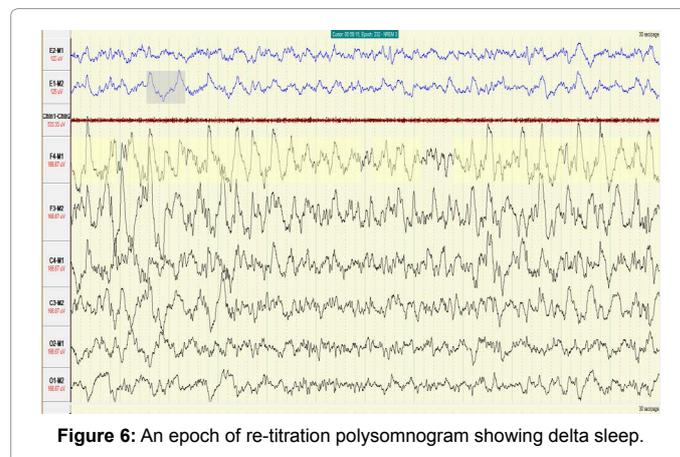


Figure 6: An epoch of re-titration polysomnogram showing delta sleep.

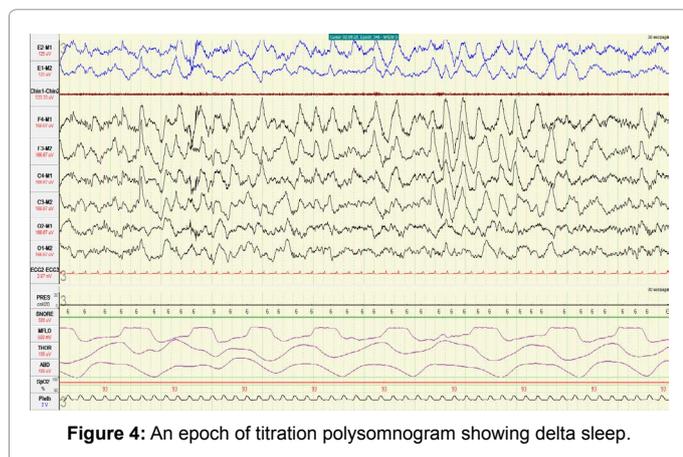


Figure 4: An epoch of titration polysomnogram showing delta sleep.

Second

Gabapentin is one of the commonly used medications for neuropathic pain. This medication has been reported to increase slow wave sleep with one study reporting a 5 percent increase from baseline and another study reporting 12 minutes of increase from the baseline duration respectively [3,4]. Our patient was started on Gabapentin 900 mg daily for chronic pain syndrome 2-3 months before her re-titration study and she denied taking this medication at the time of her baseline and titration sleep studies. As previous studies have established that both Pregabalin and Gabapentin can cause increased slow wave sleep, this N3 surge in re-titration could partially be attributed to Gabapentin.

Nevertheless, this percentage increase in N3 sleep appears out of proportion to what has been reported in the literature. Our patient was also taking Bupropion (minimal effect on sleep architecture) [5], Venlafaxine (suppresses REM sleep and minimal effect on delta sleep) [6], Buspirone (decreases delta sleep) [7], and Methylphenidate (minimal effect on sleep architecture) [8] which are not known to increase stage N3 sleep.

Third

As reported in the literature, OSA patients can have increased slow wave sleep on their first night of CPAP titration. This was our first impression after looking at this patient's titration study where stage N3 sleep was increased to 58% from baseline of 15%. When compared with re-titration, which has significant prolongation in proportion of stage N3 sleep, it is apparent that the etiology of this large increase in slow wave sleep is multifactorial. Increase N3 on first night of CPAP was likely due to treatment of OSA. Prolongation of N3 to 86% on re-titration was most likely a combination of acute sleep deprivation, Gabapentin and treatment of OSA.

At least 100 million Americans are suffering from chronic pain and associated healthcare cost is considered higher than heart disease, diabetes and malignancy [9,10]. A large number of chronic pain patients (41%) demonstrate poor sleep quality and as much as 60% patients with chronic neuropathic pain suffer from sleep disturbances [11,12]. CPAP not only alleviate cardiovascular complications associated with OSA but also improves quality of life by decreasing daytime sleepiness [13]. There is also a possible analgesic role of CPAP in improving pain tolerance in chronic pain patients [14]. Of note, obesity is another growing major

health problem in United States with estimated prevalence of 35% [15]. Obesity and chronic pain do have interplay between each other [16], and obesity is the strongest risk factor for OSA [17]. Therefore screening for OSA can be very helpful in this demographic especially with coexistent obesity. As chronic neuropathic patients are often taking medications like Gabapentin for their neuropathic pain and PAP treatment of OSA in such patients with their concomitant use of Gabapentin could have a synergistic effect on their sleep quality.

Conclusion

Recognition of sleep disordered breathing in chronic pain patients can be of utmost importance as CPAP can not only improve sleep quality but also could have analgesic effect. Chronic pain patients who are taking medications like Gabapentin could have synergistic effect on sleep quality when combined with PAP therapy. Future research is needed to further investigate the effect of increase slow wave sleep on chronic pain, obesity, and Non-REM parasomnias.

Acknowledgement

The institution where the work was primarily performed is Sleep Disorders Center, University of Michigan, Ann Arbor, MI 48109, USA.

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