

SUMMARY

Background: Insomnia is one of the most prevalent sleep disorders, negatively impacting the quality of life and increasing the risk of other health problems. Many patients with insomnia underestimate their sleep quantity compared to objective sleep measures. This objective and subjective sleep discrepancy (sleep misperception) occurs in different insomnia subtypes as well as in insomnia with a comorbid psychiatric disorder. Although previous research suggests that the sleep discrepancy reflects specific objective sleep alterations, the results of studies are inconsistent. Moreover, its relation to psychiatric comorbidities is not clear, as well as its role in the insomnia treatment.

Aims: The theoretical part of the present thesis aimed to provide an overview of the recent research on sleep discrepancy in insomnia. The experimental part consists of four studies with the following goals: (1) to explore sleep electroencephalographic (EEG) correlates of sleep discrepancy in insomnia patients (Study 1); (2) to assess the association between sleep discrepancy and psychopathology (Study 2); (3) to examine changes of sleep discrepancy during and after the cognitive behavioural therapy for insomnia (CBT-I; Study 3); (4) to assess whether the additional chronotherapeutic tool can enhance the effect of CBT-I on sleep parameters.

Methods: All four studies included patients with chronic insomnia. Study 1 also included a good sleeper control group (GS). In this study, patients were further divided into three insomnia subtypes according to the objective sleep parameters, and the presence or absence of sleep discrepancy. Subjective and objective (polysomnographic; PSG) sleep parameters were compared between the groups. The sleep EEG activity was further analysed by a power spectral analysis. Study 2 compared the degree of sleep discrepancy between groups of insomnia patients with and without depressive symptoms. In both of these PSG studies, correlational analyses were conducted to examine EEG correlates of sleep discrepancy. Objective sleep measures in Studies 3 and 4 were obtained by actigraphy. Study 3 compared the treatment outcome in patients with different subjective sleep evaluations. Study 4 explored the effect of CBT-I in combination with a blue-light blocking glasses compared to the CBT-I group with clear placebo glasses.

Results: Both PSG studies found a significant association between a reduction of REM sleep proportion and a degree of sleep discrepancy. Reduced REM sleep was also the only common feature found in the two different groups of patients with sleep misperception. A higher degree of sleep discrepancy was observed in insomnia patients with depressive symptoms, and this tendency was associated with depression severity. Studies on CBT-I revealed a significant reduction of sleep discrepancy after the therapy. In Study 3, patients with accurate estimates of sleep at baseline tended to overestimate sleep quantity after the CBT-I. A similar result was found in Study 4. Only patients in the CBT-I group with blue-light blocking glasses tended to overestimate their sleep quantity after the treatment when compared to the CBT-I group with placebo glasses.

Conclusions: The findings are in line with the assumption that insomnia patients with sleep discrepancy show specific sleep alterations, highlight the importance of REM sleep in subjective evaluation of sleep, point out the association between sleep discrepancy and depressive symptoms, and prove the efficacy of CBT-I in reducing sleep discrepancies. The additional chronotherapeutic tool showed promising results by enhancing the effect of CBT-I. Future studies should explore the role of sleep discrepancy in common pathophysiology of insomnia and depression, use more sensitive neurophysiological measures, and also involve patients who overestimate their sleep quantity.