

Executive Summary

Objective

To verify clinical evidence of polysomnography in the diagnosis of sleep related breathing disorder (SRBD), the following objectives were established for this study. Firstly, evidence of diagnostic accuracy of polysomnography for the diagnosis of SRBD was to be confirmed through systematic review. Secondly, medical text books and relevant clinical guidelines were reviewed to confirm evidence of polysomnography in the diagnosis of SRBD.

Method

In this study, systematic review was performed primarily to investigate the existence of scientific evidence. If scientific evidence was not found, the study was to proceed to confirm medical standards. Firstly, as for the systematic review, PubMed (998 articles) and KoreaMed (115 articles) were searched to identify those on the accuracy of polysomnography (Attended full night polysomnography) for the diagnosis of SRBD. Secondly, to review medical standards for diagnosis of SRBD, text books and clinical guidelines were selected through a consultation meeting participated by two clinical experts (Affiliated with the Korean Academy of Sleep Medicine and the Korean Sleep Research Society). Principles & Practice of Sleep Medicine (5th ed.) and Sleep disorders medicine: basic science, technical considerations, and clinical aspects (3rd ed.) and three clinical guidelines published by the US Academy of Sleep Medicine (Practice Parameters for the Indications for Polysomnography and Related Procedures: An Update for 2005; Practice parameters for the respiratory indications for polysomnography in children; Clinical guideline for the evaluation, management and long-term care of obstructive sleep apnea in adults) were reviewed.

Result

As a result of the systematic review regarding accuracy of polysomnography for the diagnosis of SRBD, no original article could be selected that met the inclusion/exclusion criteria established in this study. Majority of the literature suggested polysomnography as a gold standard and reported other tests (Including split-night polysomnography and portable polysomnography) for sensitivity and/or specificity tests. In addition, reports pertaining to consistency in polysomnography results, side effects of polysomnography, and significance of clinical judgment could be found.

Since the evidence of diagnostic accuracy of polysomnography could not be found in the systematic review, we reviewed medical text books and clinical guidelines to confirm medical standard, all of which specified that polysomnography performed in a laboratory is the most standard test method for the diagnosis of SRBD and assessment of its severity.

To evaluate SRBD, polysomnographic indices such as electroencephalogram (EEG), electro-oculogram (EOG), chin electromyogram (Chin EMG), airflow, and blood oxygen saturation should be checked. It is also noted that even if polysomnography is performed in a laboratory, there remains the possibility of inaccurate diagnosis/classification of patients due to night-to-night variability, test-retest reliability, and intra-rater, inter-rater event recognition errors. In addition, to ensure technical accuracy and reliability of polysomnography, it is specified that relevant conditions, including atmosphere of laboratory, standardized method of polysomnography, and continuous supervision by a professional polysomnographic technician, should be satisfactory. It is emphasized that more consideration should be given for children to ensure that they can feel comfortable in the laboratory.

Polysomnography has been commonly suggested as a medical standard for the diagnosis of SRBD in the text books and guidelines reviewed in this study. However, due to limitations of polysomnography including requirement of extensive time and cost, some of the references also suggested modifications to polysomnography. These specify that split night test that finds an appropriate continuous positive airway pressure overnight for

diagnosis and treatment of SRBD can be an alternative to standard polysomnography. However, daytime nap method in which the test is performed during the day time instead of the night time was not recommended due to various limitations. As mentioned earlier, polysomnography requires extensive time and cost. Due to this reason, screening patients with a higher probability of SRBD through a preliminary test and then performing polysomnography in these patients was also suggested. In addition, it is noted that a comprehensive sleep test considering preliminary test results such as history and physical examination, on top of polysomnography should be performed for the diagnosis of SRBD by a physician specializing in sleep disorders.

Conclusion

It was confirmed that the text books and clinical guidelines reviewed in this study specified that polysomnography performed in a laboratory under the supervision of a polysomnographic technician was the gold standard for the diagnosis of SRBD and assessment its severity. To ensure technical accuracy and reliability of polysomnography, relevant conditions, including atmosphere of the laboratory, standardization of polysomnography, and continuous supervision by a professional polysomnographic technician, should be satisfactory. Although polysomnography is the gold standard, it will be appropriate to perform a comprehensive sleep test considering preliminary test results such as history and physical examination, on top of polysomnography, for the diagnosis of SRBD by a physician specializing in sleep disorders, rather than relying on polysomnography alone.