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Cost-Utility of Mandibular Advancement Devices in Mitigating Sleepiness and Traffic Accident Risk in Obstructive Sleep Apnea

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Abstract

Objectives: Mandibular advancement devices (MADs) are an effective alternative treatment for obstructive sleep apnea (OSA), improving daytime symptoms and enhancing quality of life. However, evidence on the cost-effectiveness of MAD for OSA treatment remains limited. This study aimed to conduct a cost-utility analysis comparing MAD treatment for OSA to no treatment in Thailand.

Methods: A social perspective was adopted to evaluate the cost-utility of MAD compared to no treatment using a Markov model with a lifetime horizon in OSA patients with excessive daytime sleepiness (EDS). Input parameters were drawn from international and national sources, including published literature, national databases, and local expert consultations. Costs were presented in the United States dollar (USD), and a 3% discount rate was applied to both costs and outcomes, in accordance with Thailand's National HTA Guidelines.

Results: The base case analysis indicated that using MAD resulted in an increase in QALYs by 0.85, with additional costs of 3,308 USD. This resulted in an ICER of 3,891 USD, which is slightly lower than the willingness-to-pay threshold in Thailand, set at 4,526 USD per QALY. MAD was found to be cost-effective, with a probability of cost-effectiveness of 51.9%. Parameters influencing cost-effectiveness were identified and the most sensitive parameters affecting changes in the incremental cost-effectiveness ratio (ICER) were examined through the one-way sensitivity analysis.

Conclusions: MAD therapy appeared marginally cost-effective in Thai settings for OSA patients with EDS. The considerable uncertainty revealed in sensitivity analyses suggests that further research is needed to clarify key parameters and inform decision-making.

Keywords: cost-effectiveness analysis, cost-utility analysis, economic evaluation, mandibular advancement devices, obstructive sleep apnea, road traffic accidents