To Stim or to Slice: A Meta Analysis and Systematic Review of Uvulopalatopharyngoplasty compared to Hypoglossal Nerve Stimulation for the Treatment of Obstructive Sleep Apnea

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Introduction

- Obstructive Sleep Apnea (OSA) is a common and serious condition involving repeated airway blockage during sleep, leading to disrupted breathing and low oxygen levels.
- Associated with increased risk of cardiovascular disease, cognitive decline, and mortality.
- CPAP therapy, the standard treatment, is often poorly tolerated by patients.
- Uvulopalatopharyngoplasty (UPPP) is a traditional surgical option but has high complication rates and limited long-term success.
- Hypoglossal Nerve Stimulation (HGNS) is a newer, minimally invasive treatment that helps maintain airway patency during sleep.
- HGNS has shown improved patient outcomes and quality of life in clinical studies.
- This meta-analysis compares HGNS vs. UPPP in moderate to severe OSA using data from randomized controlled trials.

Methods

This systematic review and meta analysis was conducted following PRISMA 2020 guidelines. A comprehensive search was performed using Scopus, Pubmed, Web Of Science, Cochrane Library, Embase, and Google Scholar using a search string.

- Included studies were RCTs containing either the implementation UPPP or HGNS for OSA.
- Primary outcome measure was the Apnea-Hypopnea Index (AHI), which is a validated method of determining severity of OSA.

Results

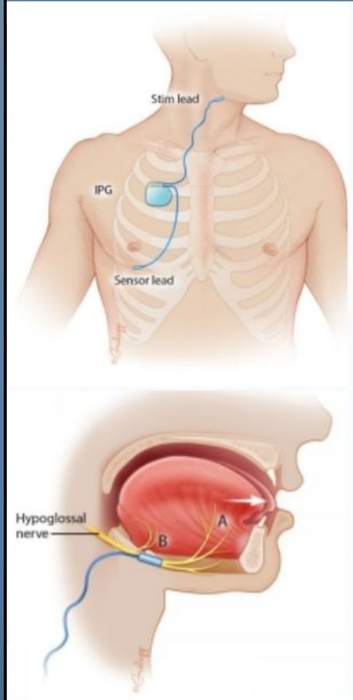


Image 1: Hypoglossal Nerve Stimulation

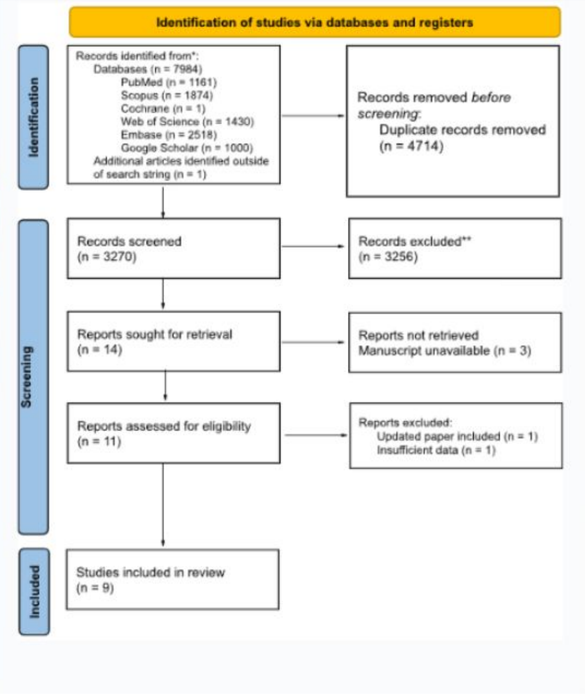


Figure 1: Prisma 2020 Flow Diagram of Included Studies

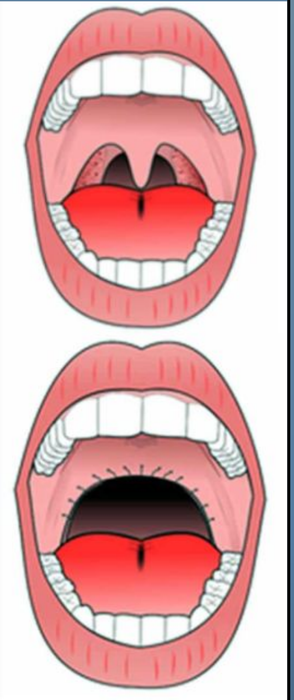


Image 2: Uvulopalatopharyngoplasty

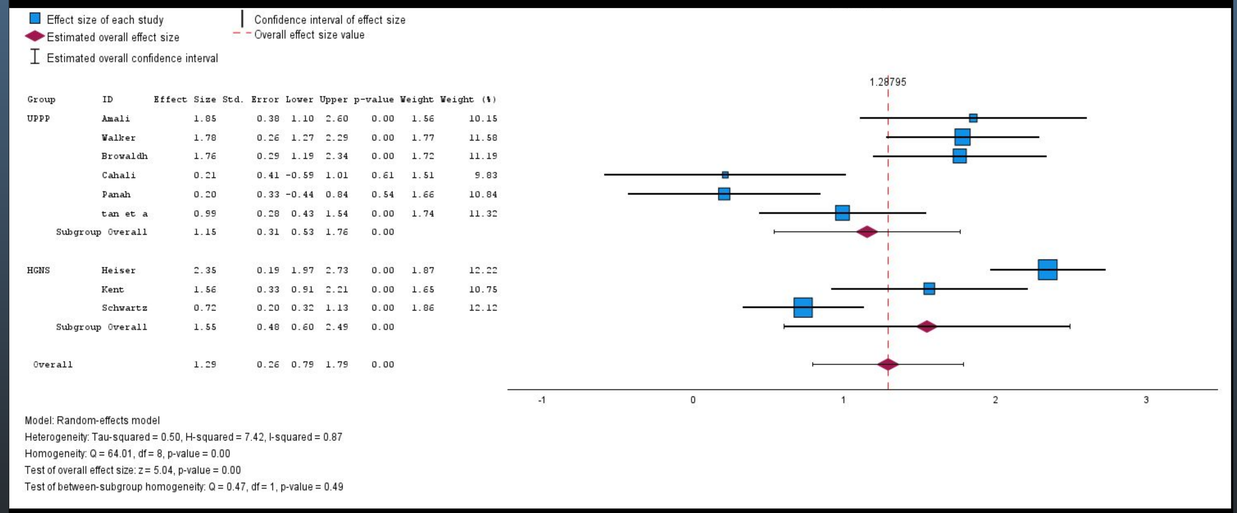


Figure 2: Forest Plot of Interventions

Results

A total of 9 RCTs with 365 adults diagnosed with moderate to severe obstructive sleep apnea were included for analysis.

- HGNS compared to UPPP had a greater post procedural reduction on AHI ($d = 1.545$ $p < 0.01$) vs ($d = 1.149$ $p < 0.01$).
- Despite high heterogeneity ($I^2 = 0.87$) HGNS showed superior AHI outcomes.

Discussion

- HNGS resulted in a greater reduction in AHI score compared to UPPP.
- Titratability of HGNS allows for optimization based on patient needs.
- Tissue sparing nature of HGNS reduces post procedural airway restrictions and stenosis associated with UPPP.
- Based on the greater reduction in AHI and the more moderate side effect portfolio, HNGS may be a viable alternative to UPPP for patients with obstructive sleep apnea.
- Further research, including RCTs including larger patient populations is necessary to solidify current data regarding the clinical efficacy of each treatment.

References