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A meta-analysis and systematic review of the effects of sensory modulation treatments for neurogenic oropharyngeal dysphagia

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ADMINISTRATIVE INFORMATION

Support - There's no financial support for this systematic review.

Review Stage at time of this submission - Data extraction.

Conflicts of interest - Shaheen Hamdy is the chief scientific officer and stocks/shares holder of Phagenesis Ltd., a company involved in neuromodulatory dysphagia treatment. Other authors declare that there is no conflict of interest.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 7 March 2025 and was last updated on 7 March 2025.

INTRODUCTION

Review question / Objective Oropharyngeal sensory stimulation has been applied broadly in clinical dysphagia management, but evidence remains limited. We aim to determine its effectiveness in treating neurogenic dysphagia (ND).

Condition being studied Neurogenic dysphagia.

METHODS

Participant or population Targeted participants are patients with neurogenic oropharyngeal dysphagia - resulting from central or peripheral nervous system damage - diagnosed clinically or through validated self-report questionnaires, regardless of the timing of symptom onset. Studies with only healthy participants, patients without dysphagia, or those with dysphagia without neurogenic conditions, and dysphagia in elderly patients without any neurogenic diseases are excluded.

Intervention We include studies comparing oropharyngeal sensory stimulations.

Comparator Sham, placebo, or standard dysphagia therapy.

Study designs to be included Studies are eligible for analysis if they were randomised controlled trials (RCTs) including parallel, cross-over, cluster-RCTs or quasi-RCTs.

Eligibility criteria Exclusion criteria include animal studies, case studies, open-label trials, observational studies, retrospective analyses, studies lacking original data, and non-English publications.

Information sources The search is conducted across five electronic databases: PubMed,

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EMBASE (via Ovid), CINAHL, Web of Science, and the Cochrane Library. Reference checking and additional citation searching are also conducted, and relevant references from prior review articles are identified.

Main outcome(s) We include outcome measures related to swallowing, primarily functional evaluation scales based on clinical or instrumental assessments, as well as validated self-reported dysphagia questionnaires. Studies that used decannulation and reintubation rate as a primary outcome measure are also included, as decannulation decisions were made based on severity of dysphagia as a surrogate.

Quality assessment / Risk of bias analysis The Cochrane Risk of Bias 2 (ROB 2) tool is applied for risk of bias analysis.

Strategy of data synthesis Statistical analyses are conducted using Review Manager online (https://revman.cochrane.org/info). Treatment effect sizes were calculated by comparing treatment outcomes to those of the control groups. Data used for calculating treatment effects include group sizes, mean differences (Mean pre-treatment – Mean post-treatment), and pooled standard deviations (SDs). For the combination of the dichotomous data and continuous data, we switch OR to SMD and SE(OR) to SE(SMD), also SE is calculated based on the upper/lower limit of 95% CI.

Subgroup analysis Subgroup analysis is conducted based on different interventions and data types.

Sensitivity analysis A leave-one-out analysis is employed to understand the impact of each individual study on the overall pooled effect estimate and the heterogeneity.

Country(ies) involved United Kingdom, China.

Keywords dysphagia, meta-analysis, neurogenic, systematic review, treatment.

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