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Which screening tool should be used for identifying aspiration risk associated with dysphagia in acute stroke? A Cochrane Review summary with commentary

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Abstract.
BACKGROUND: Dysphagia is a common impairment in patients with acute stroke and is associated with an increased risk of complications such as aspiration pneumonia, malnutrition and dehydration, as well as with poor outcome and higher mortality. Therefore, immediate screening for aspiration risk is recommended, using a bedside swallow screening tool.
OBJECTIVE: To determine the diagnostic accuracy and the sensitivity and specificity of bedside screening tests for detecting risk of aspiration associated with dysphagia in people with acute stroke.
METHODS: A summary of the Cochrane Review by Boaden et al. 2021, with comments from a rehabilitation perspective.
RESULTS: The review included 25 studies with 3953 participants and 37 screening tests. No single study demonstrated 100% sensitivity and specificity with low risk of bias for all domains. The best performing swallow screening tools were the Bedside Aspiration test (combined water swallow and instrumental tool), the Gugging Swallowing Screen (GUSS, water plus other consistencies) and the Toronto Bedside Swallowing Screening Test (TOR-BSST, water only). However, these tests were based on single studies with small sample sizes. It was not possible to explore the influence of sources of heterogeneity.
CONCLUSIONS: No single swallow screening tool with high accuracy as well as good quality evidence could be identified, but recommendations for further high-quality research are offered.

Keywords: Deglutition disorders, respiratory aspiration, stroke, diagnosis, systematic review

The aim of this commentary is to discuss from a rehabilitation perspective the Cochrane Review "Screening for aspiration risk associated with dysphagia in acute stroke" (Boaden, et al., 2021) by Boaden E, Burnell J, Hives L, Dey P, Clegg A, Lyons MW, Lightbody CE, Hurley MA, Roddam H, McInnes E, Alexandrov A, Watkins CL[a], published by Cochrane Stroke Group. This Cochrane Corner is produced in agreement with NeuroRehabilitation by Cochrane Rehabilitation with views* of the review

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[a]This summary is based on a Cochrane Review previously published in the Cochrane Database of Systematic Reviews 2021, Issue 10, Art. No.:CD012679, DOI: 10.1002/14651858.CD012679.pub2 (see www.cochranelibrary.com for information). Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback, and Cochrane Database of Systematic Reviews should be consulted for the most recent version of the review.

*The views expressed in the summary with commentary are those of the Cochrane Corner authors (different than the original Cochrane Review authors) and do not represent the Cochrane Library or Wiley.

summary authors in the "implications for practice" section.

Background

Dysphagia is a common impairment in patients with acute stroke and is associated with an increased risk of complications such as aspiration pneumonia, malnutrition and dehydration, as well as with poor outcome and higher mortality (Boaden, et al., 2021; Dziewas, et al., 2021). Therefore, current practice guidelines advise immediate swallow screening (National Institute for Health and Care Excellence [NICE], 2019), to identify risk of aspiration before administering fluids or food, so that interventions can be put in place to prevent or reduce morbidity until access to specialist equipment and staff is available. Therefore, bedside swallow screening tools are recommended. However, there is no universally accepted screening tool for the identification and management of aspiration associated with dysphagia, and a wide range of screening tests are used in clinical practice throughout the world. The screening test that most accurately identifies the presence or absence of aspiration associated with dysphagia is yet to be identified, to better inform a food and drink consistency management plan.

Screening for aspiration risk associated with dysphagia in acute stroke

(Boaden E, Burnell J, Hives L, Dey P, Clegg A, Lyons MW, Lightbody CE, Hurley MA, Roddam H, McInnes E, Alexandrov A, Watkins CL, 2021)

Objective

The aim of this Cochrane Review was to determine the diagnostic accuracy and the sensitivity and specificity of bedside screening tests for detecting risk of aspiration associated with dysphagia in people with acute stroke.

What was studied and methods

The population addressed in this review was adults (aged $\geq$ 18 years) with a clinical diagnosis of acute stroke admitted to the hospital. Patients with subarachnoid hemorrhage were excluded or analyzed separately. The diagnostic interventions studied were bedside swallow screening tests, used by nursing staff or other healthcare professionals (HCPs), with the exclusion of speech and language therapists (SLTs). Studies were included if they reported the accuracy of the bedside screening tool for identification of the risk of aspiration owing to dysphagia after acute stroke. The primary objective was to determine the diagnostic accuracy and the sensitivity and specificity of the test. The secondary objective was to assess the influence of the following sources of heterogeneity on the diagnostic accuracy of bedside screening tools for dysphagia:

- Patient demographics (e.g. age, gender)
- Time post stroke that the study was conducted (from admission to 48 hours) to ensure only hyperacute and acute stroke swallow screening tools are identified
- Definition of dysphagia used by the study
- Level of training of nursing staff (both grade and training in the screening tool)
- Low-quality studies identified from the methodological quality checklist
- Type and threshold of index test
- Type of reference test

Results

The review included 25 studies with 3953 participants and 37 screening tests. Six tools considered water and other consistencies (sensitivity and specificity ranged from 75% to 100% and from 69% to 90%, respectively), 24 used water only (sensitivity and specificity ranged from 46% to 100% and from 43% to 100%), and seven used other methods (sensitivity and specificity ranged from 29% to 100% and from 39% to 86%).

The review shows that:

- No single study demonstrated 100% sensitivity and specificity with low risk of bias for all domains
- The best performing swallow screening tools were the Bedside Aspiration test (combined water swallow and instrumental tool), the Gugging Swallowing Screen (GUSS, water plus other consistencies) and the Toronto Bedside Swallowing Screening Test (TOR-BSST, water only)
- The outcome was aspiration risk in 15 and dysphagia in 20 screening tools; sensitivity is

similar, but specificity is better when dysphagia is the outcome
- The best-performing index tests are included in the group carried out by nurses, while tests carried out by other HCPs are less consistent
- It was not possible to explore the influence of sources of heterogeneity.

Conclusions

The authors concluded that it was not possible to identify a single swallow screening tool with high accuracy as well as good quality evidence. They gave recommendations for further high-quality research such as to clearly define primary outcomes, provide more detail regarding participant inclusion and exclusion criteria, participant location and timing of the swallow screening tool used, and reference tests used. Also, future research should detail the amount and content of training offered to HCPs and should examine the impact of training on study fidelity and outcomes. Lastly, future studies should apply the better performing screening tests that were identified to allow building up a body of evidence, reducing heterogeneity between screening tests, and ultimately allow a meta-analysis of different tests.

Implications for practice in neurorehabilitation

As recommended in a NICE guideline for acute stroke (NICE, 2019), swallow screening by a properly trained HCP must be performed as fast as possible after admission and in any case before being given any oral intake. If this indicates a swallowing problem, a specialist assessment should follow preferably within 24 hours and maximum 72 hours later, in order to define feeding and rehabilitation strategies. No single swallow screening tool with high accuracy could be identified in this review, and further high-quality studies are needed. Regarding specificity and sensitivity, water plus other consistency tools (GUSS) are preferred over water only tests; the latter (TOR-BSST) could be useful in case of specifically trained nurses are lacking or when the test is carried out by other HCPs (not SLTs).

Conflict of interest

The authors declare no conflicts of interest.

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