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Title: Commentary: How common is dysphagia in older adults living at home and what are the potential risk factors?

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Abstract

Dysphagia, or difficulty swallowing food or drink, can lead to poorer health outcomes and serious complications such as aspiration pneumonia. Dysphagia can often go undetected and is known to be common amongst hospitalised older adults and those living in institutional care. Less is known about the prevalence of dysphagia amongst older adults who live at home. This commentary critically appraises a systematic review that determines prevalence rates and risk factors for dysphagia in the community dwelling elderly.

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Commentary on:

Madhavan A, LaGorio LA, Cray MA, Dahl WJ, Carnaby GD. Prevalence of and Risk Factors for Dysphagia in the Community Dwelling Elderly: A Systematic Review. *J Nutr Health Aging*. 2016;20(8):806-815.

Key Points:

- The prevalence rate for dysphagia in the community dwelling elderly ranged from 5-34% based on studies reported as 'high quality'. The average prevalence rate across these studies was 15%.
- In the studies of 'high quality', four risk factors were reported as significantly associated with dysphagia in the community dwelling elderly: stroke, depression, advancing age and physical frailty.
- Further research to explore clinical recognition of dysphagia within the community would be beneficial to inform screening and assessment.

Introduction

Dysphagia has frequently been defined as '*difficulty moving food from mouth to stomach*' (Logemann 1998). An individual can experience dysphagia for a multitude of reasons, including progressive neurological conditions, stroke, physiology or sarcopenia (Baijens et al. 2016). Dysphagia is more prominently associated with older patients (Altman et al. 2010) and it is estimated that between 50-75% of nursing home residents and 10% of acutely hospitalised older adults experience dysphagia (Lugger 1994; O'Loughlin & Shanley 1998). The prevalence of dysphagia is less clear in the community dwelling elderly (CDE) - older adults who live independently and do not require institutionalised or 'skilled care' in their daily lives (Madhavan et al. 2016).

Dysphagia can go unrecognised for numerous reasons including the perception of severity, subtle compensatory techniques when eating and drinking, reluctance to seek professional help, and misperception of the causes (Chen et al. 2009, Holland et al. 2011, Jardine et al. 2020, Leslie & Smithard 2021, Smithard 2018(a), Smithard 2018(b)). Un-diagnosed dysphagia is problematic as it can be a contributing factor for malnutrition and/or dehydration, weight loss, reduced quality of life and potentially worse health outcomes

including life threatening complications such as aspiration pneumonia (Baijens et al. 2016, Melgaard et al. 2018, Wirth 2016). This is particularly concerning for older adults, who are more likely to believe that swallowing difficulties are a natural part of aging and incorrectly accept their swallowing disabilities as normal (Chen et al. 2009).

To help inform the scope of dysphagia in the CDE, a systematic review was undertaken to determine the prevalence of dysphagia in this population and to identify associated risk factors (Madhavan et al. 2016). This commentary will critically appraise the methods used in the review, and consider what the findings mean for community practice.

Methods

The systematic review undertook a comprehensive search of published and unpublished studies using a range of electronic databases (including MEDLINE, EBSCO etc.) and citation searches up to 2014. One author screened titles and abstracts for inclusion and two authors independently screened full-text studies. The following inclusion criteria were applied: studies must discuss the prevalence and/or risk factors associated with dysphagia in the CDE, be published in English, be accessible in full text and must not evaluate any medical/surgical/behavioural intervention. The review excluded studies where subjects were under the age of 60. From the included articles, one author abstracted study characteristics and data. Where risk factors were reported by more than one study, Comprehensive Meta-Analysis Software was used to calculate the combined effect sizes. The methodological quality of the selected studies was then assessed using the Newcastle-Ottawa Scale (NOS) for cross-sectional or cohort studies. Each study was blindly rated for quality by two authors and in the case of any discrepancies, a third reviewer was consulted. An analysis of ratings between reviewers showed strong agreement of between 86 and 100%. A study that scored ≥ 5 points on the NOS was deemed by researchers to be of 'high quality'.

Results

The review search identified 35 potential articles, of which 15 were included in the review following screening. Included studies were published between 1990 and 2014 and were mostly cross-sectional by design, analysing data from a group at a specific time-point. There was only one prospective study, that followed a group over time. Recruitment into the included studies was via larger trials, assisted living facilities, census data, a primary care database, and research advertising. Overall, there were 9947 participants, of which 5549 (56%) were female. Most participants were over 65, except for one study where participants were included between 50-79 years old and two studies that included participants over 60. Participants across all included studies lived independently in the community or with minimal support. Most studies were conducted in the US (6 studies) or Asia (5 studies) with 3 conducted in Europe and one in the UK, and all published in English. Assessment tools used for determining dysphagia were varied, ranging from self-reported swallowing assessments to water swallow screening undertaken by a clinician. Only two included studies used a validated measure for use in the elderly population, these were the Sydney Swallowing Questionnaire and the Volume-Viscosity swallow test.

Six of the included studies achieved a quality rating of 5 points or more and were subsequently deemed by the review researchers to be of 'high quality'. Eight studies achieved a rating of 4 points and one study was rated at 3 points. Included studies that failed to reach the high-quality rating, did so due to un-blinded outcome assessments, unjustified sample sizes, absence of detail on non-responders, or an unclear description of the statistical methods used.

Prevalence of dysphagia in the CDE was reported to be between 5 and 72%. Four of the six 'high quality research studies' reported on prevalence ranging from 5 to 34%, with a mean of 15%. The only cross-sectional study to use a validated assessment tool for use in the older population (Sydney Swallowing Questionnaire) reported a mean of 11.4%.

A wide range of risk factors or risk markers associated with dysphagia in the CDE population were reported in ten studies and three of the 'high-quality studies'. Within these three studies, the strongest associations were: history of clinical disease like stroke (odds ratio [OR]=2.7, 95%CI 1.109-7.632), depression (Spearman's correlation=0.133, OR 3.045, 95%CI 1.149-7.7962), advancing age (Spearman's correlation =0.107) and physical frailty ($r=0.34$) which were all reported to be significant ($p\leq 0.05$).

Within the ten studies reporting risk factors overall and including those determined to be of a lower quality, history of non-acute stroke, pre-frailty, reduced ability to perform activities of daily living, pain and depressive symptoms, oral health such as missing dentition, advanced age, and female gender were all reported as a significant association, yet statistics were not provided. The review authors were unable to comment on whether any of these risk factors caused dysphagia or their individual impact due to the statistical analyses utilised in the included studies.

Commentary

Using the Joanna Briggs Institute Critical Appraisal tool for systematic reviews (Aromataris et al. 2015), 7 out of the 11 criteria were judged to be satisfactory for this review. The criterion that were not met or were unclear related to: extraction of individual study data (only one author undertook this task and no piloting reported); lack of clarity on statistical methods used to combine study results; no assessment of publication bias and problematic interpretation of the quality assessment utilised. The authors identified that a study scoring ≥ 5 out of a possible 9 or 10 criteria on the NOS was deemed to be of high quality. This does

not take into account the weighting of each criterion and may mis-represent the actual level of study quality. Thus, it was deemed that overall, this systematic review provides a summary of the available study results that address the question of interest. However, caution should be applied to assuming accuracy or consistency of the results due to the limitations reported, and the low number of studies identified for individual risk factors.

The systematic review determined that the prevalence rate of dysphagia in the CDE ranged from 5 to 34%, based on the rates identified from four 'high quality' studies. Due to the nature of dysphagia being under-recognised and given that three of the four studies utilised self-report assessments, it could be suggested that the true estimate may be towards the higher end of the range. The potential impact of such prevalence within the CDE is considerable given that elderly patients with dysphagia have potential for reduced health outcomes including malnutrition, respiratory infections and aspiration-pneumonia (Cichero 2018, Cohen et al. 2020, Melgaard et al. 2018, Saito et al. 2018). Furthermore, a diagnosis of dysphagia increases the potential for mortality both in hospital and within 6 months of hospitalisation (Melgaard et al. 2018).

In the systematic review, the risk factors associated with dysphagia in the community dwelling elderly were stroke, advancing age, frailty and depression. Taking each risk factor in turn, we know that stroke can impair swallowing physiology (Martino et al. 2005) and dysphagia is observed in 29-64% of those with stroke (Mann et al. 2000). Dysphagia is also acknowledged to be more common in older persons, especially those with multiple co-morbidities, leading it to be recognised as a 'geriatric syndrome' (Baijens et al. 2016). Frailty has previously been associated with dysphagia in the CDE (Bahat et al. 2019) and has a prevalence of between 4 and 59% in this population (Collard et al. 2012). Furthermore, elderly and frail patients may have an impaired swallowing function (such as reduced swallowing speed) before clinical symptoms are evident, as has been observed in elderly individuals with sarcopenia (Chen et al. 2020). Finally, it has previously been suggested that

depression has a close link with swallowing, frailty, and malnutrition (Sella-Weiss 2021). Depression within the community dwelling elderly has been reported to range from 8-16% (Blazer 2003) although it may be largely undetected in this population.

With the support of other literature, it is suggested that the risk factors identified in the review may be associated with dysphagia in the CDE. Raising awareness of such risk factors for dysphagia amongst the community sector may help with earlier recognition and referral onwards to speech and language therapy. Current NICE guidance suggests that people in hospital and the community who present with indicators of dysphagia '*should be referred to health care professionals with relevant skills and training in the diagnosis, assessment and management of swallowing disorders*' (NICE 2006). Indicators listed include 'difficult/painful chewing or swallowing' and 'regurgitation of undigested food' with a full list available in the guidance. Further guidance and resources to help community staff with screening for dysphagia would subsequently be useful to aid appropriate onwards referral.

With the ageing population and the increasing recognition of dysphagia as a "geriatric giant", there is a clear need to achieve early identification in the community and co-ordinated management to optimise treatment and help prevent life threatening complications (Feng et al. 2019, Melgaard et al. 2018, Smithard et al. 2018(a), Smithard et al. 2018(b), Smithard et al. 2020, Rofes et al. 2011). Guidance for the management of swallowing difficulties in older people often remains limited to specific conditions such as stroke and dementia (British Geriatrics Society 2012) and further support for the community sector would be welcomed to develop an individualised approach for older people.

Future research would now benefit from an update of the systematic review by Madhavan et al. 2016, given the search for included studies was completed in 2014. Furthermore, to help inform the community sector in screening and identifying dysphagia, more research with patients, carers and staff would be useful to explore and inform mechanisms for clinical recognition.

CPD questions

- Should patients in the community who have one or more of the potential risk factors identified in this review be screened for dysphagia?
- How is dysphagia identified in the community and how could this be improved, e.g. earlier identification, use of a validated screening tool?

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