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Short Communication

Transforming Care with an AI-Driven Early Detection Tool of Dysphagia to Address the Nutritional Needs of Hospitalized Older Adults: A Short-Term Pilot Study

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ABSTRACT

Dysphagia and malnutrition often affect older adults in hospitals, leading to worse health, longer stays and a higher risk of mortality. In this one-day pilot at a regional hospital in Barcelona, we tested early screening with the AIMS-DO bedside swallowing tool. We excluded patients who were terminally ill or had conditions that made assessment unsafe. All participants gave informed consent. Clinicians with experience conducted bedside checks and reviewed records to identify those at risk. Nineteen patients, primarily women with an average age of 79.6, were diagnosed with dysphagia. The median hospital stay was 34 days and most had trouble with daily activities. The 40% received exercise plans tailored to their needs. Of those with dysphagia, 79% were also malnourished. Early screening with AI support helped us quickly find and manage malnutrition linked to dysphagia.

Keywords: Dysphagia, Malnutrition, Older adults, Artificial intelligence, Nutrition, Multidisciplinary care

Abbreviations: Artificial intelligence (AI), Artificial Intelligence Massive Screening – Oropharyngeal Dysphagia (AIMS-DO®) oropharyngeal Dysphagia (DO), Mini Nutritional Assessment-Short Form (MNA-SF), Body Mass Index (BMI), Barthel Index (BI) and Volume-Viscosity Swallow Test (MECV-V).

1. Introduction

Dysphagia and malnutrition often happen together in older adults, raising the risk of infection, slow healing, muscle loss and loss of independence. Problems with swallowing can lead to poor nutrition and faster decline, so finding these issues early is very important. Using structured screening, along with personalized nutrition and rehab, can help slow health problems and improve outcomes. In this study, we looked at early, systematic detection and targeted care for dysphagia in older hospital patients. The AIMS-DO® AI tool helped us identify individuals at risk by reviewing clinical records. Our team, made up of different specialists, took part in training and regular reviews to improve how we manage dysphagia and malnutrition. We wanted to see whether early detection and tailored care could improve nutrition and we also tested the AIMS-DO system's performance in a regional hospital.

Methods

The team conducted a one-day cross-sectional pilot in a regional hospital in Barcelona. They screened 119 inpatients from the convalescent care unit. The team excluded patients with terminal illness or anatomical disabilities that prohibited safe swallowing evaluation. The AIMS-DO® system flagged 19 patients at potential risk for dysphagia. Clinicians confirmed dysphagia using the Volume-Viscosity Swallow Test (MECV-V)[1] in all of these patients.

Demographic and clinical data included age, sex, MNA-SF, BMI and Barthel Index. The MNA-SF and Barthel Index are validated bedside tools for assessing nutrition and functional status in frail older adults[2,3]. Interventions matched individual risk profiles through fluid viscosity and textured-diet modifications. A team of clinicians, dietitians, nurses and speech-language pathologists coordinated assessment and care. Education for patients and carers emphasized safe swallowing, dietary modifications and adherence. Staff training promoted consistent tool use and continuity of care[4]. Methods are summarized in **(Figure 1)**.

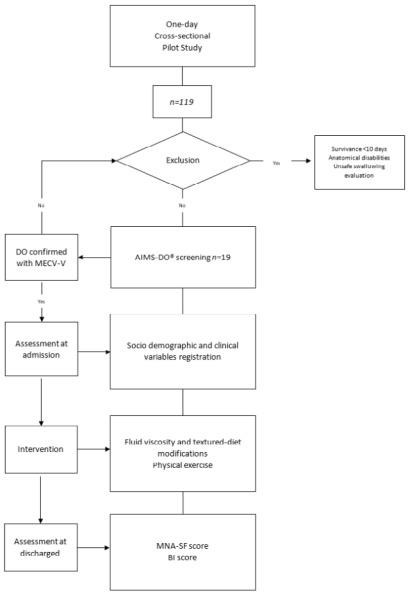

Figure 1: Methodology flowchart.

Results

(Table 1) shows details for the 19 patients with dysphagia. Most had several health problems. Nearly half needed help with daily activities, as shown by low Barthel Index scores. Screening found that 79% were malnourished. The average MNA-SF score was 5.6 and the average BMI was 26.0 kg/m². This shows that having extra body weight does not rule out malnutrition. BMI alone does not give enough information about muscle mass, so tools like the MNA-SF are important for a complete assessment.

The AIMS-DO® system identified dysphagia-related malnutrition faster and more accurately than older methods, which often miss subtle problems[5,6]. After MECV-V testing, the staff adjusted diets and fluids as needed. About a quarter of patients needed thickeners. Initially, 79% were malnourished and fewer than 40% received dietary supplements. Each case involved a specialist team that provided personalized care and improved outcomes. After targeted care, 63% improved their MNA-SF scores (3 points higher) and nearly half were more independent at discharge (8 points higher in BI scores). Early detection allowed quick action, especially for patients with extended stays or complex needs. These findings suggest that early, team-based, personalized care improves nutrition and daily function. We measured outcomes only at discharge, so long-term effects remain unknown.

Table 1: Patient Characteristics and Targeted Interventions.

Characteristic	SD OR % (n=19)
Age (mean ± SD)	79.6 ± 11.7
Female (%)	57.80%
Hospital length-stay (days mean ± SD)	34
Pre-admission living at home (%)	99%
Inpatient at Convalescent Care Unit (%)	47.30%
Primary diagnoses at admission (%)	Cardiorespiratory disease 36.8%
	Fractures 21%
	Stroke 15.7%
Barthel Index score points (mean ± SD	30.5 ± 24.1
Targeted Interventions (%) *	Exercise prescription 40%, Dietary supplements prescription 40%
	Thickener prescription 26.3%

Discussion

The AIMS-DO® enabled rapid detection of dysphagia and facilitated timely, targeted care, resulting in improved nutrition for 63% of patients. These results highlight the benefits of structured, technology-supported screening combined with personalized care[5,7,8].

Applying AI-based screening with collaborative team care delivers faster and more reliable identification and supports precise treatment[4,9]. Expanding access to these tools, along with telehealth and education, can extend impact where specialists are limited. Equipping caregivers with knowledge about food choices, taste and preparation strengthens adherence to care plans. Monitoring outcomes-such as aspiration, nutrition and hospital stays-drives continual improvements[10].

Limitations

Because this study was cross-sectional, we cannot establish causality or track patients over time. Since the research was conducted at a single hospital, the results may not be broadly generalizable. The non-random sample might not represent all older adults in hospitals. We did not control for other health conditions or medications, which could have influenced the results. Interpret these findings with caution.

Studies should include more hospitals, track patients or use randomized designs to confirm and extend findings. It is essential to examine what facilitates or hinders the implementation of these approaches. Researchers should also ask patients about quality of life and independence to improve care plans.

Conclusion

Dysphagia and malnutrition are often overlooked in older hospital adults, leading to worse health outcomes. This study shows that early AI-supported screening with personalized, team-based care helps manage these problems sooner and more effectively. Using these methods in practice could improve nutrition, reduce complications and aid recovery.

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