

## Main Article

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# Oropharyngeal dysphagia in children with multiple disabilities

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## Abstract

**Objective.** This study aimed to investigate the prevalence of oropharyngeal dysphagia among institutionalised children with multiple disabilities, a topic with limited literature coverage.

**Methods.** The study employed a questionnaire, specifically the F-PEDI-EAT-10, to screen for dysphagia in children. Trained nurses administered the questionnaire to the participants.

**Results.** The study included 117 children with multiple disabilities (51.3 per cent boys and 48.7 per cent girls) with an average age of  $14 \pm 4.7$  years. The questionnaire revealed that 53 per cent ( $n = 62$ ) of the children had a positive score and, surprisingly, 29 per cent of them ( $n = 18$ ) did not have a confirmed diagnosis of oropharyngeal dysphagia. Notably, children with a positive F-PEDI-EAT-10 score had a significantly higher prevalence of pneumopathy and undernutrition compared with those with a negative score.

**Conclusion.** This study underscores the high prevalence of oropharyngeal dysphagia among children with multiple disabilities, a condition that is often underdiagnosed.

## Introduction

The epidemiology of oropharyngeal dysphagia in children is underrepresented in the literature. In the general population, it is reported to affect approximately 1 per cent of children per year in the USA.<sup>1</sup> However, its prevalence in children with disabilities is considerably higher, ranging from 35 to 80 per cent in those with neuromuscular pathologies and reaching up to 90 per cent in children with cerebral palsy.<sup>2</sup> Oropharyngeal dysphagia can lead to various complications, including undernutrition, dehydration and respiratory infections, which can range from simple bronchial infections to inhalation pneumonitis with septic shock. These respiratory infections are a leading cause of morbidity and mortality, and significantly impact quality of life.<sup>3</sup>

Recently, a questionnaire for assessing swallowing in children, the F-PEDI-EAT-10<sup>4</sup> was developed based on an adult questionnaire known as EAT-10. It has been validated in the French language as F-PEDI-EAT-10. This questionnaire enables the evaluation of the presence or absence of dysphagia and the quantification of the severity of the disorder, including the assessment of the risk of aspiration.<sup>5</sup>

The primary objective of this study was to determine the prevalence of swallowing disorders in a population of institutionalised children with multiple disabilities using the F-PEDI-EAT-10 questionnaire.

## Materials and results

This was an observational multicentre study conducted from November 2019 to June 2020 involving children with multiple disabilities residing in institutions in Normandy, France. The study adhered to the ethical principles outlined in the Declaration of Helsinki (approved by Rouen University Hospital under advice E2021-73). We contacted all medical and social institutions that cater for children with multiple disabilities in Normandy.

The data collected included age, gender, weight, height, the presence of known swallowing disorders, feeding methods, the presence of a gastrostomy or nasogastric tube, and the number of pulmonary infections during the year. The F-PEDI EAT-10 questionnaire was administered by a nurse familiar with the children. A score exceeding 4 out of a total of 40 indicated suspicion of oropharyngeal dysphagia. An analysis of variance was conducted to determine any associations between screening for swallowing disorders using the F-PEDI-EAT-10 and the feeding status, the presence of respiratory infections, undernutrition and mealtime exceeding 45 minutes. We set the significance level at 5 per cent to denote statistically significant differences, with a 95 per cent confidence interval for all tests.

## Results

A total of 25 institutions were approached, resulting in a response rate of 52 per cent. In total, 117 children with multiple disabilities were enrolled (51.3 per cent boys and 48.7 per cent girls), with an average age of  $14 \pm 4.7$  years. The majority of multiple disabilities fell

**Table 1** Comparison of children (*n* and %) with F-PEDI-EAT-10 >4 and those with F-PEDI-EAT-10 <5 as a function of dietary adaptations, lung infections, nutritional monitoring, undernutrition and meal duration >45 minutes

Parameter	F-PEDI-EAT-10 >4 ( <i>n</i> = 62) ( <i>n</i> (%))	F-PEDI-EAT-10 <5 ( <i>n</i> = 55) ( <i>n</i> (%))	<i>P</i>
Dietary adaptation	57 (91.9)	12 (21.8)	<0.001
Lung infection	24 (38.7)	12 (21.8)	<0.05
Nutritional monitoring	40 (64.5)	30 (54.5)	ns
Undernutrition	21 (33.9)	10 (18.1)	<0.05
Meal duration >45 min	30 (48.4)	16 (29.1)	<0.05

ns, non-significant

into the neurological (39.3 per cent) and genetic (36.7 per cent) categories. Fifteen per cent of the patients had no identified aetiology. Among the children, 53 per cent (*n* = 62) were completely reliant on caregivers for meals and 31 per cent (*n* = 36) required partial assistance, while 8 per cent required supervision. A total of 91.5 per cent (*n* = 107) of the children had dietary modifications, including adjustments to solid or liquid textures or enteral feeding. Children on exclusive enteral nutrition constituted 16 per cent (*n* = 17) of the population.

Analysis of the F-PEDI-EAT-10 results indicated that 53 per cent (*n* = 62) of the children had a positive F-PEDI-EAT-10 score. Among these children, 29 per cent (*n* = 18) did not have a confirmed diagnosis of oropharyngeal dysphagia. The number of children with feeding adaptations was significantly higher when the F-PEDI-EAT-10 score was positive. Additionally, the occurrence of respiratory infections and undernutrition was significantly more frequent among children with a positive F-PEDI-EAT score (see Table 1 for details).

## Discussion

This study represents the first attempt to assess the prevalence of oropharyngeal dysphagia using a questionnaire among children with multiple disabilities residing in medical-social centres. Our results revealed an alarmingly high prevalence of oropharyngeal dysphagia. Previous studies have emphasised that oropharyngeal dysphagia in individuals with disabilities should be a top health priority due to its high prevalence and severe complications.<sup>3-6</sup>

For instance, in the USA, among 12,709 children with cerebral palsy, it has been observed that mobility and access to proper nutrition are prognostic factors for survival. In terms of autonomy, our study indicates that 53 per cent of the children were entirely dependent on caregivers for their meals and 84 per cent of the children could not eat independently.<sup>6</sup> Interestingly, dependence on caregivers increased the risk of dysphagia. In addition, children who were fed by tube had a life expectancy that was 7 years longer than that for children who were not tube fed, and this increased to 14 years for children exclusively fed by a third party.

Regarding pulmonary infections, our study revealed that 30.8 per cent of the children experienced at least one pulmonary infection during the year. Respiratory infections continue to be the leading cause of both mortality and morbidity.<sup>7</sup>

The findings from this study strongly emphasise the importance of diagnosing oropharyngeal dysphagia because it appears that early diagnosis leads to better management, with reduced rates of pulmonary infection and undernutrition, and enhanced nutritional care. Furthermore, in addition to the frequently noted neurological aetiologies in this population,

one noteworthy aetiology is iatrogenic oropharyngeal dysphagia. The study highlights a high usage of anticonvulsive treatments and, to a lesser extent, benzodiazepines, neuroleptics and muscle relaxants. These treatments are known to negatively affect the ability to eat.<sup>8</sup>

This study, characterised by its multicentric nature and the substantial number of participants (*n* = 117), offers a comprehensive representation of a specific population, namely children with multiple disabilities in institutional settings. This representativeness is further reinforced by the inclusion of all eligible children in the study. In addition, it should be noted that the F-PEDI-EAT-10 questionnaire is a French translation of PEDI-EAT-10, which is a standardised and validated tool accessible to parents or caregivers without specific prerequisites.

- Swallowing disorders are present in children with multiple disabilities
- The prevalence of these disorders is high
- The presence of swallowing disorders is associated with an increased risk of respiratory infections

It is important to highlight that children with disabilities often present complex and interconnected oral disorders, encompassing various functions such as feeding, phonation and communication, all centred around the anatomical unit of the mouth. It is essential, from a diagnostic perspective, to distinguish between these broader oral disorders and the more specific swallowing disorders that involve impairment of a single function affecting multiple anatomical components. Various screening questionnaires may address oral disorders, but the F-PEDI-EAT-10 specifically targets swallowing.

## Conclusion

Oropharyngeal dysphagia is prevalent and underdiagnosed in children with multiple disabilities. The F-PEDI-EAT-10 serves as an appropriate tool for screening, monitoring and assessing the effectiveness of treatments or dietary adaptations. It is imperative to conduct routine screening for oropharyngeal dysphagia and nutritional assessments for every child with multiple disabilities because they are at a high risk of pulmonary and nutritional complications. There is a pressing need for more comprehensive assessments and increased awareness of oropharyngeal dysphagia in this vulnerable population to improve their overall health and quality of life.

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