CASE REPORT/OLGU SUNUMU

NUTRITIONAL MANAGEMENT AND SUPPORT IN A PATIENT WITH CEREBRAL PALSY: A CASE REPORT

SEREBRAL PALSİLİ BİR HASTADA BESLENME YÖNETİMİ VE DESTEĞİ: OLGU SUNUMU

Aylin ŞAHNA [1, *], Pırıl TUNCAY [2], Kadriye TOPRAK [3]

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ABSTRACT

Cerebral palsy (CP) is one of the most common neurodevelopmental disorders in childhood; it is a heterogeneous and complex clinical condition that causes permanent impairment in motor skills. CP affects not only motor functions but also sensory, cognitive, behavioral, and nutritional aspects, significantly reducing the quality of life of individuals. Complications such as dysphagia, gastroesophageal reflux, and oromotor coordination problems, in particular, make oral feeding difficult and necessitate enteral nutrition. Malnutrition negatively affects the prognosis of CP and can pave the way for the development of secondary health problems. Therefore, in the follow-up of individuals with CP, medical nutrition therapy should be evaluated with a multidisciplinary approach. In this study, the enteral feeding process in a case of CP with severe motor impairment was addressed, highlighting the importance of nutrition management.

Keywords: Cerebral palsy, Enteral nutrition, Percutaneous endoscopic gastrostomy, Ketogenic diet, Nutrition management

*** Correspondence/İletişim**: Aylin ŞAHNA, Department of Nutrition and Dietetics, Institute of Health Sciences, Ankara Medipol University, Ankara, Türkiye, **e-posta:** dytaylinsahna@gmail.com ▪ **ORCID:** https://orcid.org/0009-0002-2731-167X

1. Aylin ŞAHNA, Department of Nutrition and Dietetics, Institute of Health Sciences, Ankara Medipol University, Ankara, Türkiye, ▪ **ORCID:** https://orcid.org/0009-0002-2731-167X

2. Pırıl TUNCAY, Clinical Nutrition Unit, Ankara Bilkent City Hospital, Ankara, Türkiye ▪ **ORCID:** https://orcid.org/0000-0002-0390-2697

3. Kadriye TOPRAK, Department of Nutrition and Dietetics, School of Health Sciences, Ankara Medipol University, Ankara, Türkiye ▪ **ORCID:** https://orcid.org/0000-0001-8706-8689

INTRODUCTION

Cerebral palsy (CP) is one of the most common physical disabilities in childhood, resulting from damage to the developing brain and affecting motor function (1). The term was first defined in 1843 by William John Little and is therefore also known as "Little's disease". Little proposed that spasticity developed as a result of brain damage occurring during infancy, premature birth, or during delivery. Subsequently, many scientists, including Osler, Sachs, Peterson, Sigmund Freud, Mac Keith, and Polani, contributed to the field, and the definition of CP evolved over time. Finally, in 2006, an expert panel defined CP as a group of permanent disorders affecting movement and posture development and stated that this condition is associated with non-progressive disorders occurring in the developing fetal or newborn brain (2).

CP is characterized by heterogeneous symptoms. Some children experience difficulties only in a specific part of the musculoskeletal system, while others may suffer from multiple impairments that limit daily living activities and life-threatening comorbidities. However, some symptoms may improve over time as the nervous system matures. Brain damage can occur before, during, or immediately after birth, affecting both the neurological and musculoskeletal systems, leading to abnormal muscle contractions, postural abnormalities, and movement restrictions. In addition, sensory impairments, perceptual and cognitive impairments, communication difficulties, behavioral problems, epilepsy, and secondary musculoskeletal disorders may also accompany the condition (2). Although oxygen deprivation at birth has traditionally been considered the main cause of CP, recent research has shown that it is a multifactorial disease that develops as a result of the interaction of various risk factors (3, 4). It is now accepted that CP is the result of a series of events that cause damage to the brain during development.

The epidemiology of CP has undergone some changes over time. The prevalence of CP, which occurs in 2–3 per 1,000 live births, remained stable for many years (1). With advances in medical technology, the survival rate of premature babies increased before 1990, leading to a rise in the prevalence of CP. However, with improvements in prenatal care, this rate has declined over time. Between 1990 and 2003, the prevalence remained stable at 2.2–2.3, after which a downward trend was observed (3, 5). According to a study conducted in Australia, the prevalence of CP declined from 2.1 to 1.4 after 1995. However, in developing countries, inadequate service provision for the prevention and management of CP due to economic constraints may lead to an increase in the severity of the disease. Although this situation demonstrates the positive effects of developments in prevention and management strategies, further research is still needed. Increasing evidence for new, low-cost treatment techniques, in particular, promises more favorable outcomes (6,7). Epidemiological studies worldwide show that the incidence of CP remains relatively stable. However, deficiencies in the management of complications associated with prematurity still emerge as a significant risk factor for CP development (8).

In recent years, various strategies for preventing and managing CP have been described in the literature. These include the use of magnesium sulphate, progesterone, and corticosteroids during pregnancy due to their neuroprotective effects, as well as therapeutic hypothermia interventions. These interventions have been found to be effective in preventing prematurity, one of the major causes of CP (6,7). CP arises from damage to the developing brain before, during, or after birth. This condition, which is associated with numerous impairments such as perception, cognition, communication, behavior, epilepsy, and secondary musculoskeletal problems, is characterized by abnormal resistance in body movements, postural abnormalities, and movement limitations. The aetiology may encompass the prenatal, perinatal, and postnatal periods. Various risk factors have been identified, including maternal health. While the

prevalence of CP remains stable thanks to various preventive and therapeutic strategies, information provided by the mother, particularly from birth onwards, is crucial for early diagnosis. Today, diagnostic tools are available to identify CP before five months of age (2).

Due to the heterogeneous nature of CP, a comprehensive assessment and management process by multidisciplinary teams is required in children. In addition to traditional treatment methods, the development and application of new techniques offer promising steps towards improving the quality of life of children with CP. In recent years, genetic research has the potential to provide new explanations for cases of CP that cannot be explained by prenatal, birth, and postnatal risk factors. A better understanding of the relationship between genetic factors and CP will provide an important foundation for research in this field. Furthermore, artificial intelligence-supported applications may play an important role in shaping rehabilitation strategies aimed at improving the functional status of children with CP in the future (2).

The nutritional requirements of individuals with CP are similar to those of healthy individuals but may differ in certain specific cases. Dietary modifications are necessary in cases such as gastroesophageal reflux and chewing and swallowing disorders (9). Nutritional status has significant effects on the course and prognosis of the disease in terms of quality of life and longevity. On the other hand, the severity of the disease and the degree of disability affect the patient's ability to consume food and, consequently, their nutrition (10). If oral nutrition with appropriate meals (in terms of food consistency, etc.) does not ensure adequate weight gain and/or weight maintenance, medical nutritional support therapy should be considered. This nutritional support therapy includes enteral nutrition or, in certain cases, parenteral nutrition.

Most individuals with CP may require nutritional support therapy at various stages of life. Nutritional intervention should aim to maintain normal nutritional status or treat malnutrition. However, it should be emphasized that maintaining the ability to take food orally is a priority.

Furthermore, oral feeding is also extremely important in terms of the psycho-emotional state of the patient and caregivers.

Enteral nutrition is administered via a feeding tube, which may be a nasogastric tube or a nasojejunal tube. Gastrostomy and jejunostomy should be considered as non- y surgical access for enteral nutrition in the long term. This method of feeding is effective and safe, reducing the risk of choking (11,12).

Enteral feeding formulas remain the standard of care for patients with enteral access. Nutritionally complete, ready-to-use enteral tube products are suitable as the sole source of nutrition. Energy content, protein content (short- or long-chain peptides) and specific lipid substrates (medium-chain triglycerides, omega-3 fatty acids) enable the dietary management of disease-related malnutrition in patients with malabsorption and/or digestive disorders. This covers the patient's nutritional requirements in terms of both quality and quantity (13). Enteral nutrition can be administered at home under medical supervision, through a specialist clinic or a hospital unit. Home enteral nutrition has been reported to be significantly positively associated with improvements in the quality of life of patients and their families (14,15).

In light of all this information, the causes, clinical features, diagnosis, treatment, and especially nutritional management of CP should be addressed with multidisciplinary approaches, and strategies tailored to the individual's needs should be developed.

CASE

Our patient is a 26-year-old male with congenital CP and intellectual developmental delay diagnoses. The patient had previously been regularly monitored in child psychiatry, physical therapy, and neurology clinics, and in 2007, the use of various assistive devices (walker, orthopedic boot, twister, T-band, longitudinal transverse arch support) was deemed appropriate. The patient admitted to the Chest Diseases Clinic at Bilkent City Hospital in 2019 due to pleural effusion developed protein-energy malnutrition over the last three months due to more than

10% involuntary weight loss and inadequate oral intake. Nutritional support therapy was initiated with enteral products such as Nutrivigor and Fresubin YoCreme, and Multi-Thick was recommended as a thickener; nutrition was provided by thickening beverages and foods to a syrup, custard or pudding consistency.

During assessment of the patient's nutritional status, dysphagia was detected; aspiration risk, which was particularly pronounced in the evening, coughing after fluid intake, and coordination disorder in tongue movements were observed. Therefore, percutaneous endoscopic gastrostomy (PEG) was recommended for the patient, but the patient's relatives initially declined this procedure. The patient was advised to eat in a slow and upright position, undergo swallowing physiotherapy, and receive neurological follow-up. However, he did not receive swallowing therapy.

During a neurology consultation in the same year, it was noted that the patient had difficulty controlling tongue and jaw movements due to oromandibular dystonia, sometimes could not eat at all, and usually performed the swallowing process mechanically with the help of his family. This dysfunction was thought to be related to oromandibular dystonia, and treatment with Rivotril (clonazepam) was initiated with a planned dose titration.

In 2023, the patient presented to the emergency department with complaints of intermittent diarrhea, nausea, vomiting, and inability to pass gas or stool on three occasions within the last 15 days. Based on clinical findings, the patient was admitted for observation with a preliminary diagnosis of brid ileus. As no clinically significant nutritional content was obtained from the nasogastric drainage tube placed in the emergency surgical intensive care unit, oral feeding was gradually initiated, and the patient was discharged with recommendations.

In January 2024, the patient was admitted to hospital due to aspiration pneumonia. A Clinical Swallowing Assessment was performed using International Dysphagia Diet Standardization Initiative 0-3 consistencies, and aspiration symptoms were observed with both consistencies.

Therefore, it was recommended that the patient be fed entirely by non-oral means and be monitored with simultaneous swallowing exercises. The swallowing exercise programme was explained to the patient in detail, and they were informed about safe feeding principles.

In January 2025, a patient admitted to the Pulmonary Diseases Clinic at Bilkent City Hospital and monitored via nasogastric had their oral intake completely discontinued due to aspiration pneumonia and switched to enteral feeding via PEG. Upon discharge, the Cardiovascular Hospital Nutrition Unit recommended 8 x 190 mL Nutrivigor RTH, but as the constipation complaint persisted during the ongoing home care process, Home Health Services were consulted and the team visiting the home started the patient on Glucerna Select.

In March 2025, the patient was admitted to the Gastroenterology Clinic at Bilkent City Hospital with elevated ALT and AST levels and a preliminary diagnosis of toxic hepatitis. The patient's height was 160 cm, body weight 55 kg, and body mass index 21.4 kg/m². The patient's daily energy requirement was calculated as 2250 kcal. It was recommended that the patient be fed with Nutrivigor RTH at a rate of 88 mL/hour via a 17-hour continuous infusion.

In May 2025, the patient was referred to the Clinical Nutrition Outpatient Clinic at Bilkent City Hospital General Hospital for enteral nutrition management and elevated liver function tests. During the outpatient examination, it was learned that the patient continued to use Glucerna Select at home, and the product was changed. Considering the benefits of the ketogenic diet in CP, the patient's enteral nutrition product was changed to Oxepa, which has a high fat and EPA content. The patient's care records were updated with the plan and follow-up of enteral nutrition support therapy, emphasizing its seriousness and importance, and a follow-up appointment was scheduled.

DISCUSSION

CP, as one of the most complex and heterogeneous groups of neurodevelopmental disorders, profoundly affects not only motor functions but also many areas such as cognitive, sensory,

behavioral, and nutritional aspects (1,2). As seen in this case, multiple complications such as severe motor impairment, swallowing difficulties, oromandibular dystonia, and aspiration risk have made nutritional management quite complex and critical. This situation clearly highlights the necessity of enteral nutritional support in individuals with CP and the importance of implementing it through a multidisciplinary approach.

Nutritional disorders are a fundamental problem that significantly affects the quality of life and overall prognosis of individuals with CP. The literature reports that 60-90% of individuals with CP have nutritional problems, which are mostly due to inadequate oral intake, swallowing dysfunction, and gastroesophageal reflux (10,11). In this case, loss of coordination in the swallowing reflex, frequent aspiration attacks, and loss of oromotor control due to dystonia eliminated the safety of oral intake and necessitated enteral feeding.

Maintaining oral feeding for as long as possible is important not only physiologically but also for the individual's psychosocial well-being (10). However, as in this case, the transition to tube enteral feeding may become a necessity as complications increase. Initial resistance to PEG placement by the patient's family member once again highlights the importance of patient and caregiver education. The literature indicates that delaying enteral nutrition may lead to an increase in complications associated with malnutrition (13).

A personalized approach must be adopted to ensure the successful implementation of enteral nutrition. In this case, accurately calculating the daily energy requirement, selecting appropriate products (Nutrivigor, Glucerna Select, Oxepa), monitoring gastrointestinal symptoms, and providing equipment such as enteral pumps have been decisive factors in the success of enteral treatment. Furthermore, continuing enteral nutrition at home not only improves clinical outcomes but also significantly enhances the quality of life for patients and their families (13,15,16).

One of the supportive approaches to medical nutrition therapy in CP is the ketogenic diet. In this nutritional model, which is low in carbohydrates and high in fat, ketone bodies are produced to provide an alternative energy source and create potential neuroprotective effects. Although the ketogenic diet is used in some neurological disorders, primarily epilepsy, research increasingly suggests that it may have positive effects on motor functions and muscle control in CP, even in the absence of epilepsy (17,18). Therefore, the choice of Oxepa, a ketogenic enteral nutrition product, in this case reflects a holistic approach to the individual's clinical condition. However, studies evaluating the effects of the ketogenic diet on CP are limited, and further research is needed.

In conclusion, the decision to provide enteral nutrition support in individuals with CP should be made considering clinical findings, swallowing function, nutritional status, and patient/caregiver cooperation. This case once again demonstrates that nutritional problems should not be neglected and that enteral nutrition is an important intervention that improves quality of life and reduces complications. In complex clinical conditions such as CP, individualized treatment plans, multidisciplinary follow-up, and education-based approaches are of great importance for both short- and long-term success.

Abbreviations

CP: Cerebral palsy

PEG: Percutaneous endoscopic gastrostomy

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