The Importance of Good Nutrition in Children with Cerebral Palsy

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KEYWORDS

• Cerebral palsy • Malnutrition • Growth • Nutritional assessment • Enteral feeding

KEY POINTS

- In children with cerebral palsy (CP), undernutrition has significant negative consequences.
- Poor oral-feeding skills are the primary cause of inadequate nutrition in children with CP.
- Understanding the causes of poor nutrition guides nutritional intervention.
- Overcoming the challenges inherent in the physical measurement of children with CP by using heights extrapolated from segmental measures and triceps skin fold, together with weights, weight gain velocity, and monitoring these measures on appropriate growth charts, informs care providers about the need for nutritional rehabilitation and helps monitor the progress toward collaboratively established nutrition goals.
- Understanding the multidimensional aspects of oral feeding and the timing of enteral nutrition support are important elements in the nutrition rehabilitation toolkit.

INTRODUCTION

Nature of the Problem

Cerebral palsy (CP) describes "a group of persisting, nonprogressive conditions in the development of motor control that appear very early in life."[1] "The motor disorders of CP are often accompanied by disturbances of sensation, perception, cognition, communication, and behavior; by epilepsy; and by secondary musculoskeletal problems."[2] Although the primary problems associated with CP are neurodevelopmental in nature, challenges with growth and nutrition are also common in affected children.[3–5]

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As a group, children with CP are smaller and more poorly nourished than their typically developing peers. These differences between affected and nonaffected children are more marked with increasing age and with the severity of the motor impairment.[6] A complex interplay of these factors and other nutritional and non-nutritional factors impacts the growth and nutritional status of children with CP.[7]

Good nutrition is the cornerstone of health and well-being for all children, whether affected by CP or not. Weight gain and growth along predicted trajectories, reassure families and care providers that a child is thriving and is healthy. The same holds true for children with CP, but in these children the measuring and monitoring of growth is fraught with challenges that must be overcome to be able to interpret nutritional adequacy.[6,8] Understanding when a child's nutritional status is faltering is important because poor nutrition has serious consequences and is potentially remediable.[9,10]

FACTORS AFFECTING NUTRITION AND GROWTH IN CHILDREN WITH CEREBRAL PALSY

The children with CP who are at the greatest risk of having significant nutritional problems are those who present with poor weight gain at a young age,[11,12] who have significant motor impairments,[13] and who have feeding and swallowing problems.[9,14,15] Other factors affecting nutrition are detailed in **Box 1**.

Nutritional Factors

Inadequate intake

The most significant factor affecting the nutritional status of children with CP is inadequate intake to meet metabolic demands.[16] In turn, food processing and swallowing problems, which affect 30% to 40% of children with CP, are the primary reasons for inadequate intake.[5,8,17] **Box 2** describes the feeding problems that are common in children with CP.

In general, children with more significant motor impairments have more challenges with oral feeding and have poorer nutritional outcomes. Even mild feeding skill deficits can have a significant impact on the quantity of food consumed. For example, children with CP who require only minor modification of their food texture or viscosity to aid in food processing and swallowing have decreased fat stores, suggesting that they have

Box 1
Factors affecting growth and nutrition in children with cerebral palsy

Nutritional factors:

Inadequate intake primarily related to feeding dysfunction

Increased calorie losses

Increased calorie use

Non-nutritional factors:

Age

Genetic factors

Physical factors related to the child's neurologic condition

- Neurotrophic factors
- Lack of weight bearing and mechanical stress on the long bones

Endocrine factors