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The weaning practices: A new challenge for pediatricians?

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Abstract

Introduction of complementary feeding, or weaning, is the period where infants are gradually introduced to solid foods, with a progressive reduction of breastfeeding or bottle-feeding. Weaning represents a crucial nutritional moment in the growth and development of infants, and it can also affect future health. Throughout the years, various weaning strategies have been proposed, ranging from classic to baby-led weaning. Recently, vegetarian-/vegan-based approaches are also being increasingly adopted by young parents. This rostrum aims to critically address the safety profiles of current weaning practices for infants and to highlight the important role of pediatricians in choosing the most advisable weaning approach for their patients.

KEYWORDS
baby-led weaning, complementary feeding, infant nutrition, pediatrician, vegan diet, vegetarian diet, weaning

1 | INTRODUCTION

The transition from exclusively breastfeeding to the introduction of solid foods other than milk is one of the most critical stages in a child's development. According to the World Health Organization (WHO), the introduction of complementary food should begin when exclusive breastfeeding can no longer provide sufficient nutrients and energy for the child's growth and development. Breast milk is considered to ensure proper child growth and development up to 6 months.[1] The introduction of solid foods does not correspond to the cessation of breastfeeding or bottle-feeding. Indeed, breast milk or formula milk should continue to be a primary source of nutrients for the first year of life and should preferably provide between one-third and one-half of the average total energy intake toward the end of the first year. The purpose of complementary foods is to provide additional energy and nutrients that should ideally not displace breast milk during the first 12 months. To ensure breast milk volume is maintained and to stimulate milk production, mothers should continue to breastfeed their infants frequently during the period of complementary feeding. In most Western countries, infants are traditionally first introduced to solid foods using spoon-feeding, following strict weaning timing and schedules with specific foods designed to provide the child with all the nutrients needed for growth and development. Nevertheless, in recent years, an alternative method, which promotes self-feeding of the child from the age of six months, also referred as to "baby-led weaning" (BLW), has grown in popularity, and other alternative methods, such as vegetarian/vegan weaning, are also becoming more popular.

2 | BABY-LED WEANING

Over the past 15 years, the traditional, complementary feeding scheme, more commonly referred to as 'weaning,' has undergone several changes leading to the generation of the alternative and more flexible BLW approach. The BLW differs from the classic approach because infants are encouraged to feed themselves from the complementary feeding period. During the BLW, parents select a range of foods to offer to their babies, who decide what to eat, quantity, and feeding pace. The acquisition of four abilities has been suggested to indicate the readiness of a child for the BLW: (1) the child can adequately sit upright without the

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need for support; (2) the child can coordinate his eyes and hands to observe, grasp, and bring food to his mouth; (3) the child can swallow solid foods; and (4) once sitting at the table with the rest of the family, the child shows interest in what other people are eating and actively ask to eat the same foods.[2] Potential advantages of the BLW approach include a lower risk of obesity, as it may encourage improved self-regulation of energy, and better diet quality, as BLW may promote acceptance of a broader range of foods due to early exposure to different tastes and textures from a wide variety of foods. Nevertheless, the positive effect of BLW on the child's diet strictly depends on whether the family eats healthy and suitable foods for the child's development. Indeed, if the family's diet is inadequate, BLW exposes the child to the risk of excessive sodium intake, saturated fat, and protein overload, with an increased risk of obesity in childhood and adolescence.[3,4] Therefore, when a family chooses this BLW, the pediatrician should remember the fundamental role of a healthy diet for the whole family members. In addition, there are several concerns about detrimental effects associated with BLW, such as the potential risk of iron deficiency, as the most common first foods introduced with BLW, including fruit and vegetables, are naturally low in iron. In contrast, the consistency of iron-rich foods, such as meat, makes it difficult for babies to self-feed, the risk of choking, as infants have tiny airways, and the risk of failure to thrive, as not all infants have the motor skills or motivation to feed themselves the amount of food they need.[5]

Key Messages

Start weaning no earlier than four months and no later than 6 months. When it is possible, infants should be breastfed during the introduction of solid foods, up to 12 months of life or longer. The positive effect of BLW on the child's diet depends on the family diet: If the family's diet is inadequate, BLW exposes the child to the risk of excessive sodium intake, saturated fat, and protein overload. Limit protein consumption. Proteins, especially those of animal origin, are essential for growth, but consuming too much protein may negatively affect the child's health. For children following a vegetarian/vegan weaning, special attention must be paid to vitamin B12, vitamin D, iron, calcium, zinc, folic acid, protein, and omega-3 fatty acids intake. The refusal of many pediatricians to accept vegan/vegetarian weaning methods can lead parents to start weaning without medical supervision, exposing children to the risk of severe nutritional deficiencies.

3 | VEGETARIAN AND VEGAN WEANING

Over the last few years, vegetarian and vegan diets have become more popular worldwide. Thus, it is not uncommon for a pediatrician to ask parents for vegetarian- or vegan-based weaning. Since vegetarian and vegan diets allow a limited variety of foods, infants following alternative weaning methods may be exposed to clinical or sub-clinical nutritional deficiencies.[6] However, despite the concerns of many pediatricians, available data show that these types of weaning are feasible and allow adequate growth, only if these diets are appropriately planned and implemented to prevent nutritional deficiencies that are a real threat for infants and can lead to neurological symptoms and brain atrophy.[6,7] Indeed, infants following a vegan diet may suffer from protein deficiency; thus, a rice protein-based infant formula supplemented with lysine, threonine, and tryptophan or soy-based infant formula fortified with methionine is needed to ensure an adequate protein intake.[8] Vitamin B12 supplementation is necessary for vegans at any age because it is almost exclusively present in products of animal origin, though it can also be found in some algae or fungi with limited bioavailability. Vitamin B12 deficiency in infants may be responsible for anemia and developmental delay, failure to thrive, and neurological symptoms.[9] Thus, it is essential to carefully monitor the values of vitamin B12, protein, vitamin D, and iron, and, if possible, breastfeeding should be continued for all the first year of life.[1]

Despite these possible nutritional deficiencies, children who follow a vegetarian/vegan weaning with an adequate intake of essential nutrients have a similar growth rate in terms of auxology to their omnivorous peers. Equally favorable are the data on hematochemical data on homogeneous populations of vegetarian and omnivorous children, showing no statistically significant differences between the two populations.

4 | CONCLUSIONS

The weaning period represents a critical time point in an infant's life, as it involves a rapid change in growth and developmental stages, and it is also associated with the development of food preferences and eating behaviors. In the last few years, alternative weaning strategies have grown in popularity, such as baby-led weaning and vegetarian or vegan weaning. Many pediatricians still have concerns about raising children on a vegan diet and may not feel confident in dealing with alternative feeding practices.[7,10] This may lead parents to conduct weaning without medical supervision or even rely on bits of advice from people who do not belong to the healthcare professional categories, exposing their children to a risk of severe nutritional deficiencies.[10] Although it is not possible to draw definitive conclusions, the new and classic weaning strategies require adequate medical counseling and parental education to avoid harmful consequences for the child's growth. In our rapidly changing society, where people are constantly exposed to a considerable load of digital and physical information, including false or misleading information, the role of pediatricians is fundamental to monitor the nutritional behavior of infants over time and actively involve and educate

parents on both the short- and long-term risks that incorrect nutrition can cause from the earliest stages of life.

CONFLICT OF INTERESTS

Authors declared they have no conflict of interests.

AUTHOR CONTRIBUTIONS

Giulia Nuzzi: Conceptualization (equal); Writing-review & editing (equal). **Carlotta Gerini**: Conceptualization (equal); Writing-review & editing (equal). **Pasquale Comberiati**: Conceptualization (equal); Supervision (lead); Writing-review & editing (equal). **Diego Peroni**: Conceptualization (equal); Supervision (lead); Writing-review & editing (equal).

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