Allergic diseases are common in adults and infants. Food allergies especially cow’s milk protein allergy (CMPA) affects infants consuming cow’s milk in the first year of life. Recently, the occurrence of CMPA in Indian infants has shown an increasing trend. Prevention of CMPA is extremely partially hydrolysed formulas may be beneficial for infants who are not breastfed and are at a high-risk of developing allergies.

Understanding cow’s milk protein allergy (CMPA)

Cow’s milk protein has two main proteins: casein and whey. The major proteins in whey are α-lactalbumin (α-Lac; Bos d 4), β-lactoglobulin (β-Lg; Bos d 5), Immunoglobulins (Bos d 7) along with bovine serum albumin (BSA; Bos d 6) and lactoferrin. Cas, β-Lg and α-Lac are considered major allergens in cow’s milk.

Milk allergy can either be immunoglobulin mediated (IgE) or non-IgE mediated. IgE mediated reaction can occur immediately after ingestion of the allergen food whereas non-IgE mediated reactions have a delayed onset, occurring about 24 hours after ingestion of the allergen food. The most common symptoms of CMPA are IgE-mediated urticaria, angioedema, acute flare-up of atopic eczema and gastrointestinal symptoms like vomiting, diarrhoea, colic reactions. Atopic dermatitis is observed in approximately 10–15% of young children. There is an increased risk of developing atopic diseases such as asthma, atopic dermatitis and rhinoconjunctivitis in children with a history of IgE-positive CMPA.

Risk of CMPA in breastfed versus not breastfed infants

The incidence of CMPA is lesser in exclusively breastfed infants as compared with formula fed infants or mixed feeds. Only about 0.5% of exclusively breastfed infants show mild-to-moderate reproducible reaction to CMP.

Human milk provides proteins as well as wide variety of proteases. These proteases breakdown proteins in human milk and aid in infant’s digestion. Proteases allow some proteins to remain intact for their bioactive functions while release functional peptides of some proteins. Proteases are also important for the absorption of high levels of amino acids in the immature gut of the infants.
Prevention and management of allergies

Prevention and management of allergies help in improving the quality of life for the infant and caregivers, and diminish the cost of healthcare. In the recent times, hydrolysed formulas (HFs) have been gaining attention for the prevention and management of CMPA. Cow’s milk proteins are subjected to chemical and enzymatic hydrolysis to reduce the molecular weight, the peptide size, and consequently, the allergenicity of the proteins. The hydrolysate formulas are generally categorized into extensively hydrolysed formulas (eHFs) and partially hydrolysed formulas (pHFs) based on the degree of hydrolysis and length of the remaining peptides. pHF play a role in prevention of atopic disease whereas eHF are recommended for management of CMPA.

Partially hydrolysed formulas and their role in prevention

Infants who are not breastfed in the first 4–6 months of life and have a family history of allergies showed benefits of pHF compared to cow’s milk in reducing the risk of allergies later in life. A meta-analysis reported the reduction in the risk of eczema in the pHF group as compared to cow’s milk formula group among children at high risk for allergy. Subsequently, an updated meta-analysis by the same authors also suggested that all hydrolysed formulas are not the same and clinically proven pHF should be used. The German Interventional Nutritional (GINI) study has shown that early intervention with partially hydrolysed whey protein formula significantly reduces the risk of developing atopic dermatitis and allergic rhinitis up to 15 years of life.

Management of CMPA with extensively hydrolysed formula

For managing CMPA, strictly avoiding cow’s milk protein (CMP) is the best strategy. When CMPA is confirmed, CMP should be eliminated for at least 6 months or for 9–12 months. Extensively hydrolysed formula (eHF) can be given for CMPA. Amino acid formula can be given when eHF is not tolerated. Partially hydrolysed formula (pHF) or extensively hydrolysed formula (eHF) with rice protein can be given if eHF based on CMP is rejected.

Summary

Allergies especially CMPA have been on the rise even in India as against the belief that it is more prevalent in the developed world. Primary prevention of allergies is better than treatment of complications associated with CMPA. Clinically proven partially hydrolysed formulas may help in preventing allergic diseases in infants and thereby prevent their complications in infants.

References


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