



POSITION PAPER

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A structured food list for dietary assessment in patients with lipid transfer protein syndrome

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Abstract

Lipid transfer proteins (LTPs) are widely distributed plant defense proteins and represent one of the most frequent causes of plant food allergy in Mediterranean countries. Due to their resistance to heat and enzymatic digestion, foods containing LTPs may induce immediate allergic reactions ranging from mild local symptoms to severe systemic reactions, including anaphylaxis. Sensitization to peach lipid transfer protein (Pru p 3) is considered the primary sensitizer in Southern Europe and is frequently associated with reactions to multiple plant-derived foods.

In clinical practice, one of the main challenges in the management of patients with LTP syndrome is the accurate identification of foods that truly trigger allergic reactions, those that are well tolerated, and those that are unnecessarily avoided due to fear or positive sensitization tests without clinical relevance.

The aim of this position paper is to describe the development and clinical use of a structured, patient-completed food list designed to facilitate dietary assessment and clinical history-taking in patients with LTP syndrome.

The proposed tool records foods that are consumed and tolerated, foods associated with allergic reactions, foods avoided due to fear or medical advice, foods excluded for nonallergic reasons, and foods with positive skin test results. Foods are organized according to plant-derived food groups and associated plant allergen families.

Based on our clinical experience in a specialized allergy consultation focused on LTP syndrome, the systematic use of this structured food list facilitates dietary history-taking, supports clinical decision-making, and may help reduce unnecessary dietary restrictions during patient follow-up.

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Impact Statement

The structured food list described in this position paper provides a practical clinical tool for allergists managing patients with lipid transfer protein syndrome. Its use facilitates structured dietary history-taking, supports clinical decision-making, and may help reduce unnecessary dietary restrictions during patient follow-up.

Introduction

Lipid transfer proteins (LTPs) are small, stable plant defense proteins widely distributed throughout the plant kingdom and represent one of the leading causes of plant food allergy, particularly in Mediterranean countries.^{1,2} Due to their resistance to heat and enzymatic digestion, LTPs can induce allergic reactions after ingestion of both raw and processed foods. Clinical manifestations usually occur within the first hour after ingestion and may range from mild local symptoms to severe systemic reactions, including anaphylaxis.³

Among LTPs, peach lipid transfer protein (Pru p 3) is considered the primary sensitizer in Southern Europe and plays a central role in LTP syndrome.^{2,4} Sensitization to Pru p 3 is frequently associated with allergic reactions to multiple botanically unrelated plant foods. However, the clinical expression of LTP syndrome is highly heterogeneous, with marked interindividual variability in triggering foods, severity of reactions, and degree of tolerance.

Sensitization detected by skin prick tests or specific IgE does not necessarily correlate with clinical reactivity, highlighting the importance of detailed dietary history-taking and careful clinical evaluation in the management of patients with food allergy.² In clinical practice, distinguishing between foods that truly trigger allergic reactions and foods that are tolerated can be particularly challenging in patients with LTP syndrome.

Dietary avoidance remains the cornerstone of management in patients with LTP syndrome. However, excessive or poorly individualized avoidance diets may lead to unnecessary food restrictions, negatively affecting nutritional status and quality of life.⁵⁻⁷ Moreover, some plant foods traditionally avoided by sensitized patients may be clinically tolerated in selected individuals, reinforcing the importance of distinguishing between sensitization and true food allergy.^{1,2}

In this context, obtaining a structured and comprehensive dietary history is essential for adequate clinical management. The aim of this position paper is to describe the development and clinical use of a structured, patient-completed food list designed to facilitate dietary assessment and clinical history-taking in patients with LTP syndrome.

Development of the Structured Food List

The accurate identification of foods that are consumed, tolerated, avoided, or associated with allergic reactions represents a key aspect of the clinical evaluation of patients with LTP syndrome. In daily clinical practice, patients frequently report complex dietary patterns that include foods

avoided due to previous reactions, positive sensitization tests without clear clinical relevance, or fear of potential allergic reactions. As a result, obtaining a structured and comprehensive dietary history may be challenging.

To address this issue, we developed a structured food list designed to facilitate dietary history-taking during consultation with patients diagnosed with LTP syndrome. The list was developed based on our clinical experience in a specialized allergy consultation and aims to provide a practical tool to support systematic dietary assessment.

Patients are asked to complete the food list before or during the consultation using a standardized format. The list includes a wide range of plant-derived foods commonly consumed in Mediterranean diets and potentially relevant in LTP sensitization. Foods are organized by major food groups, including fruits, nuts, vegetables, cereals, legumes, seeds, and aromatic herbs and spices.

For each food item, patients are asked to indicate whether the food is currently consumed without symptoms (“Eats”), has previously caused allergic symptoms (“Reaction”), is avoided due to fear or medical advice (“Fear”), or is excluded for nonallergic reasons such as personal preferences or dietary habits (“Avoidance, non-allergic”). In addition, the results of skin prick tests or molecular allergy testing may be recorded in the column “SPT/PC” when available.

Foods are also classified according to the main plant allergen families potentially involved in LTP syndrome, including LTPs, profilins (P), thaumatin-like proteins (T), and PR-10 proteins. Allergen family attribution was based on the WHO/IUIS Allergen Nomenclature database (Table 1).

The use of this structured food list allows clinicians to obtain a clear overview of the patient’s dietary patterns and to identify discrepancies between sensitization tests and actual clinical tolerance. This approach may facilitate individualized dietary counseling and help avoid unnecessary dietary restrictions in patients with LTP syndrome.

Results

The structured food list was systematically used during routine clinical evaluation in a specialized consultation for patients with LTP syndrome. Its application allowed a comprehensive overview of individual dietary patterns, clearly distinguishing foods that were consumed and tolerated, foods associated with allergic reactions, foods avoided due to fear or positive sensitization tests without clinical relevance, and foods excluded for nonallergic reasons.

In clinical practice, completion of the food list facilitated the identification of discrepancies between sensitization detected by skin prick tests or specific IgE and actual clinical tolerance. This information proved particularly useful in patients reporting extensive food avoidance, allowing clinicians to better identify foods that could potentially be reintroduced into the diet after appropriate evaluation.

The structured format of the list also simplified dietary history-taking during consultation and helped organize clinical information in a systematic manner. By grouping foods according to botanical origin and allergen families, the tool supported clinical interpretation of possible cross-reactivity patterns frequently observed in LTP syndrome.

Table 1 Structured food list for patients with LTP syndrome.

Patient label: _____		Date: ____ / ____ / ____				
Allergen family	Food	Eats	Reaction	Fear	Avoidance (non-allergic)	SPT/PC
FRUITS						
LTP	Peach					
LTP	Apricot					
LTP	Medlar					
LTP	Plum					
LTP	Cherry					
LTP	Pomegranate					
LTP	Melon					
LTP	Kiwi					
LTP	Banana					
LTP	Apple					
LTP	Pear					
LTP	Grape					
LTP	Orange					
LTP	Lemon					
LTP	Tangerine					
----	Quince					
LTP	Strawberry					
LTP	Blackberry					
LTP	Raspberry					
LTP	Blueberry					
LTP, P	Mango					
P	Persimmon					
----	Papaya					
P	Avocado					
P	Watermelon					
P	Coconut					
P	Pineapple					
NUTS						
LTP	Sunflower seeds					
LTP	Almond					
LTP	Peanut					
LTP	Walnut					
LTP	Chestnut					
LTP	Hazelnut					
----	Cocoa					
LTP	Pistachio					
VEGETABLES						
LTP	Tomato					
LTP	Lettuce					
LTP	Carrot					
LTP	Asparagus					
LTP	Broccoli					
LTP	Cauliflower					
LTP	Other cabbages					
LTP	Turnip					
LTP	Mustard					
LTP	Onion					
LTP	Celery					
LTP	Green beans					
----	Potato					
----	Lamb's lettuce					
----	Arugula					
T, LTP	Pepper					
----	Leek					

(continues)

Table 1 Continued.

Allergen family	Food	Eats	Reaction	Fear	Avoidance (non-allergic)	SPT/PC
P	Eggplant					
P	Spinach					
P	Zucchini					
----	Pumpkin					
----	Artichoke					
----	Chard					
CEREALS						
LTP	Corn					
LTP	Wheat					
LTP	Barley					
LTP	Rice					
----	Quinoa					
----	Spelt					
----	Rye					
LEGUMES						
LTP	Lentils					
LTP	Beans					
LTP	Broad beans					
LTP	Chickpeas					
LTP, P	Peas					
PR-10, P	Soy					
LTP	Lupin					
----	Alfalfa					
P	Carob					
SEEDS						
LTP	Sesame					
LTP	Flaxseed					
AROMATIC HERBS AND SPICES						
----	Parsley					
----	Rosemary					
----	Thyme					
----	Mint					
----	Peppermint					
----	Basil					
----	Fennel					
----	Oregano					
----	Turmeric					
----	Ginger					
----	Cilantro					
----	Cinnamon					
LTP	Cannabis					

Note: This food list is a descriptive clinical tool designed to support structured dietary history-taking in patients with lipid transfer protein syndrome and has not undergone formal validation. Allergen family attribution is based on the WHO/IUIS Allergen Nomenclature database. The symbol “—” indicates that a specific allergen family has not been assigned or is not clearly defined for the purpose of this clinical tool.

Instructions for completion:

Eats: Check all foods you currently eat without symptoms. Reaction: Mark foods that have caused allergic symptoms. Fear: Foods avoided due to fear or medical advice. Avoidance (nonallergic): Foods excluded for nonallergic reasons. SPT/PC: Foods with a positive skin prick test.

In addition, the use of the food list facilitated follow-up of patients over time by providing a standardized record of dietary habits, reported reactions, and diagnostic test results. This approach contributed to a more structured and individualized dietary assessment during routine clinical practice.

Discussion

LTP syndrome represents a complex clinical entity characterized by marked heterogeneity in clinical presentation, triggering foods, and severity of allergic reactions. In Mediterranean countries, sensitization to Pru p 3 is highly prevalent and frequently associated with allergic reactions to multiple plant-derived foods.^{1,2}

A frequent challenge in clinical practice is the discrepancy between sensitization detected by diagnostic tests and actual clinical reactivity. This discrepancy may lead to unnecessary dietary restrictions and excessive avoidance behaviors. Current clinical recommendations emphasize that the management of IgE-mediated food allergy should rely on careful correlation between clinical history and sensitization patterns rather than on diagnostic testing alone.⁸

In this context, obtaining a detailed and structured dietary history is essential for the adequate clinical management of patients with LTP syndrome. However, patients often report complex dietary patterns that include foods avoided due to previous reactions, positive sensitization tests without clinical relevance, or fear of potential allergic reactions. As a result, identifying foods that are truly responsible for allergic symptoms may be challenging during routine clinical consultations.

The structured food list described in this position paper was developed as a practical clinical tool to facilitate systematic dietary history-taking. By documenting foods that are consumed and tolerated, foods causing allergic reactions, foods avoided due to fear, and foods excluded for nonallergic reasons, the instrument provides a clear overview of the patient's dietary habits and reported reactions.

Structured tools for dietary history-taking may be particularly useful in complex food allergy phenotypes such as LTP syndrome, where cross-reactivity between botanically unrelated plant foods is frequently observed. In addition, the organization of foods according to botanical groups and allergen families may assist clinicians in interpreting possible cross-reactivity patterns and in planning individualized dietary recommendations.

The use of this structured food list may also facilitate patient follow-up over time by providing a standardized record of dietary habits, reported reactions, and diagnostic test results. Identifying discrepancies between sensitization and clinical tolerance may help clinicians guide patients toward safer and more individualized dietary choices, potentially reducing unnecessary dietary restrictions.

Limitations

This position paper has several limitations that should be acknowledged. First, the structured food list described herein has not undergone formal validation, and its psychometric

properties have not been evaluated. Therefore, it should be considered a descriptive clinical tool based on clinical experience rather than a validated questionnaire.

Second, the instrument was developed and applied in a single specialized center located in the Mediterranean region, where dietary habits and sensitization profiles may differ from those observed in other geographical areas. Consequently, the applicability of this tool to other populations and healthcare settings should be interpreted with caution.

In addition, the food list was designed as a clinical support instrument to facilitate dietary history-taking and should not be interpreted as a diagnostic tool. Clinical interpretation must always be performed within the context of a comprehensive allergological evaluation.

Future studies should focus on the validation of this tool in larger patient populations and in different clinical settings, as well as on evaluating its potential impact on clinical decision-making and patient management.

Conclusions

The structured food list described in this position paper represents a practical clinical tool to support dietary assessment in patients with LTP syndrome. Its use facilitates systematic dietary history-taking and helps distinguish between foods that are tolerated, foods associated with allergic reactions, and foods avoided due to fear or positive sensitization tests without clinical relevance. This approach may support more individualized dietary recommendations and help reduce unnecessary dietary restrictions during patient follow-up. Further studies are needed to evaluate the clinical impact and potential validation of this tool in different healthcare settings.

Mandatory Disclosure on Use of Artificial Intelligence

The authors declare that AI-assisted tools were used as follows: ChatGPT (OpenAI) for language editing and grammar checking, as well as minor support in formatting bibliographic references. All references have been manually verified for accuracy and relevance.

Author Contributions

All authors made substantial contributions to the manuscript and meet the authorship criteria. Specifically, all authors contributed to:

1. The conception and design of the work, or the acquisition, analysis, or interpretation of data.
2. Drafting the manuscript or revising it critically for important intellectual content.
3. Final approval of the version to be published.
4. Agreement to be accountable for all aspects of the work and to ensure that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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