CONTINUING MEDICAL EDUCATION EXAMINATION

The Role of Regulatory T Cells in IgE-Mediated Food Allergy

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CME Items

1. Under homeostatic conditions, which is the default immune response to food antigens delivered through the oral route in the gastrointestinal mucosa?
   a) Generation of allergen-specific Treg cells to ensure oral tolerance
   b) Generation of allergen-specific T_H2 cells leading to allergic sensitization
   c) The activation of effector cells such as basophils or mast cells
   d) Infiltration by eosinophils

2. How many subsets of Treg cells have been identified?
   a) One: thymus-derived naturally occurring FOXP3$^+$ Treg cells
   b) Two: plasmacytoid and myeloid Treg cells
   c) Two: thymus-derived naturally occurring FOXP3$^+$ Treg cells and inducible Treg cells, which can in turn be divided into 3 different subsets (FOXP3$^+$ iTreg, FOXP3$^-$ IL-10–producing Treg cells [Tr1], and TGF-β–expressing T_H3 cells)
   d) Many different subsets: T_H1, T_H2, T_H17, T_H9, or T_H22, all of which contribute at different levels to the sensitization and effector phases of allergic reactions

3. How can Treg cells suppress the development of allergic reactions?
   a) By directly inhibiting effector cells and blocking the infiltration of eosinophils into inflamed tissues.
   b) By promoting tolerogenic DC phenotypes
   c) By favoring the production of allergen-specific IgG4 and inhibiting IgE
   d) By inhibiting T_H2, T_H1, and T_H17 immune responses
   e) All the above are correct

4. Which of the following sentences is true?
   a) Only immature DCs are able to polarize Treg cell responses
   b) Vitamin D3 does not affect the capacity of DCs to polarize Treg cells
   c) Mature pDCs are not able to polarize functional Treg cells in humans and mice
   d) Probiotic or specific pathogen-derived molecules do not affect the tolerogenic properties of DCs
   e) DCs use a large number of soluble and costimulatory molecules to imprint Treg cell programs in naïve CD4$^+$ T cells

5. Which of the following molecules can be used by Treg cells to suppress allergic reactions?
   a) IL-10, TGF-β, IL-35, granzyme A and B, CD25, and adenosine
   b) GATA3 and IL-4
   c) DC-SIGN, OX40-L, and TIM4
   d) TLR4, TLR8, IL-6, and IL-1β

6. Which is the predominant type of T-cell response in food-allergic patients?
   a) T_H0/T_H1 responses
   b) Treg cells with suppressive capacity, but only after generation of T-cell lines from PBMCs
   c) T_H2 responses characterized by high production of IL-4 and IL-13 but not INF-γ
   d) T-cell responses are not detected in food-allergic patients

7. Which of the following sentences is true?
   a) Milk-allergic patients who tolerate heated milk display significantly more proliferative allergen-specific Treg cells than patients who do not tolerate heated milk
   b) Milk-allergic patients have fewer nTreg cells than healthy individuals
   c) Allergen-SIT is one of many curative treatments currently available for IgE-mediated food allergy
   d) SCIT is the most efficient and safest treatment for peanut allergy, with very few reported adverse reactions

8. Which of the following sentences is true?
   a) Different clinical trials show oral immunotherapy to be safe and able to induce desensitization in patients who are allergic to milk, egg, or peanut
   b) Allergen-specific serum IgG4 levels are never increased in successful OIT for milk, egg, or peanut allergy
   c) The term tolerance refers to the induction of clinical nonresponsiveness while treatment is continued
   d) Induction of tolerance is only generated in the gastrointestinal mucosa

9. In which of the following organs is tolerance induced through the generation of functional Treg cells?
   a) Kidney
   b) Heart
   c) Skin
   d) Tonsils
   e) None of the above

10. Which of the following sentences is true?
    a) In the tonsils, pDCs contribute to the generation and maintenance of allergen-specific Treg cells
    b) Much lower numbers of allergen-specific Treg cells are found in the tonsils than in peripheral blood
    c) Triggering of specific TLRs and proinflammatory cytokines does not break allergen-specific T-cell tolerance in the tonsils and peripheral blood
    d) The lingual tonsils are not part of mucosa-associated lymphoid tissue