

Allergy and Immunology for the Internist – Questions

Case 1: 25 y/o pregnant female with a five-year history of nasal congestion, sneezing and rhinorrhea on a year-round basis with peaks in April and late summer. She resides in a 100 yo home with a water-damaged basement along with her husband, two dogs and a cat. The patient admits to the daily use of an over-the-counter nasal spray for the last several months.

The most likely diagnoses in this patient is/are:

- A. Perennial allergic rhinitis secondary to animal danders or indoor mold
- B. Seasonal allergies due to oak tree pollen sensitivity and ragweed
- C. Rhinitis of pregnancy
- D. Rhinitis medicamentosa

Which diagnostic tests would be most helpful?

- A. Nasal smear for eosinophils
- B. Puncture skin tests
- C. RAST testing
- D. Total IgE
- E. Patch testing

Case 2: 34 y/o with IVDA is admitted to the hospital with bacterial endocarditis requiring penicillin and aminoglycoside treatment. However the patient has a history of a penicillin allergy.

How would you proceed?

- A. Major and minor penicillin skin tests
- B. Infectious disease consultation for alternative agent
- C. Desensitization to penicillin
- D. Obtain specific details of previous penicillin reactions

Case 3: A 35 y/o male suffered a bee sting while mowing the lawn. He presents to the emergency room within an hour of the sting with complaints of feeling lightheaded, short of breath, and has a diffuse, pruritic rash.

Which of the following therapies should be instituted first?

- A. Epinephrine
- B. Anti-histamine
- C. Intravenous saline
- D. Albuterol nebulization

Which of the following are considered appropriate management for this patient?

- A. Prescription of auto-injectable epinephrine upon discharge
- B. Referral to an allergist for specific bee venom skin testing
- C. Serum beta tryptase measurement
- D. All of the above
- E. None of the above

Case 4: A 19 y/o college student is admitted to the ICU after suffering increasing facial swelling and respiratory distress after being hit in the face with a book falling off a shelf. She subsequently is intubated due to concerns of laryngeal swelling and narrowing. After recovery, the patient reports several prior episodes of swelling and a previous intubation. She denies any medication use, active illnesses or prior surgeries.

What laboratory studies would be appropriate in this patient?

- A. C1 esterase inhibitor protein level
- B. C1 esterase inhibitor functional assay
- C. C4 measurement
- D. All of the above
- E. None of the above

The patient is referred for an evaluation by an allergist. She is anxious about an upcoming wisdom tooth extraction. The most likely agents to be administered to the patient in the week prior to this procedure is:

- A. Danazol
- B. Prednisone
- C. Anti-histamines
- D. Leukotriene antagonist.

Answers

Case 1

Question 1, Answer: The most logical answer is **A**, perennial allergic rhinitis secondary to animals (2 dogs, 1 cat) or indoor molds. Answer B does not explain year-round symptoms in this patient, however may explain seasonal peaks in April and late summer. Answer C would only explain symptoms during the recent pregnancy and does not fit the duration and character of the symptoms. Answer D, rhinitis medicamentosa, may be a complication in this patient, but only during the last year and still does not adequately explain symptoms for 5 years.

Question 2, Answer: The most appropriate testing would be **(B)**, puncture skin testing. Identification of specific allergen sensitivity by skin testing is more rapid (20 mins) and of greater sensitivity than RAST testing (answer C). A nasal smear positive for eosinophils would support the diagnosis of allergic rhinitis but without the additional information offered by skin testing such as allergen identification and possible allergen avoidance measures or environmental changes needed in the case. A total serum IgE may be elevated above the normal range and support the presence of an atopic disease but does not offer specific information. Lastly, patch testing is best used for contact mediated sensitivities (nickel allergy) and does not involve an IgE-mediated allergic mechanism.

Case 2

Question 3, Answer: A careful review of the drug allergy history is the most logical next step **(D)**. Frequently, the term drug allergy is applied to any untoward drug reaction including known medication side effects. If the history supports a classic, IgE-mediated process then skin testing with the major and minor determinants is indicated. If the patient is positive to either determinant and a penicillin-based antibiotic is the drug of choice and no other alternative class of antibiotic is effective, drug desensitization should be performed.

Case 3

Question 4, Answer: The case describes the classic findings of a subject who is suffering a venom-related anaphylaxis. The most appropriate first-line therapeutic is epinephrine in the setting of anaphylaxis (A). The use of agents such as anti-histamines, intravenous saline and albuterol would all be considered appropriate supportive measures after the administration of epinephrine.

Case 3

Answer, Question 5: Answer D. A prescription for self-injectable epinephrine would be appropriate in this case given the high (50 to 60%) risk that the patient may suffer a similar severe reaction with a future sting. The need for referral for skin testing is based on the experience that specific venom immunotherapy provides 98% protection against a future severe venom reaction. The demonstration of an elevated serum beta-tryptase level (i.e. mast cell activation) within a few hours of a presumed anaphylactic event supports the diagnosis of anaphylaxis.

Case 4:

Question 6, Answer: D. The patient relates a history of previous swelling episodes and intubation, which suggests the diagnosis of hereditary angioedema. The absence of detectable C1 esterase inhibitor would be expected in 85% of the cases of hereditary angioedema. In 15% of cases there is measurable C1 esterase inhibitor protein but it is non-functional. Therefore a functional C1 esterase inhibitor assay is also appropriate. The absence or low level of C4 would support the diagnosis of hereditary angioedema and is typically more rapidly available in most centers.

Case 4

Question 7, Answer: A. The use of androgen derivatives has been shown to reduce the frequency of attacks of angioedema in individuals who have hereditary angioedema. The apparent mechanism seems to involve induction of synthesis of C1 and rise in C4 levels. None of the other agents have been shown to be of benefit in this disorder.