

test questions PharmaCE™

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TIOTROPIUM

Goal

To provide clinicians information that will aid in the care of patients with COPD by reviewing tiotropium's pharmacology, pharmacokinetics, efficacy, and tolerability compared with that of other inhaled bronchodilators.

Objectives

After reviewing this article, the reader should be able to:

1. differentiate the mechanism of action and pharmacokinetic characteristics of tiotropium from that of other bronchodilators;
2. characterize effects of tiotropium on clinical outcomes such as lung function, symptoms, exacerbations, and quality of life;
3. compare clinical outcomes associated with tiotropium, ipratropium, and salmeterol therapy;
4. identify indications for tiotropium;
5. list common adverse effects and precautionary conditions for tiotropium.

Test Questions

1. Tiotropium bromide is a(n):
 - (a) inhaled corticosteroid.
 - (b) anticholinergic bronchodilator.
 - (c) short-acting β_2 -adrenergic antagonist bronchodilator.
 - (d) long-acting β_2 -adrenergic antagonist bronchodilator.
 - (e) mast cell stabilizer.
2. The long duration of action of tiotropium is attributed to its:
 - (a) high lipophilicity.
 - (b) slow hepatic clearance.
 - (c) deposition into the mucus layer of the upper airway.
 - (d) aerosol delivery of timed-release microspheres.
 - (e) prolonged rate of dissociation from the muscarinic M_1 , M_2 , and M_3 receptors.
3. Which of the following bronchodilators has the fastest onset of action?
 - (a) albuterol
 - (b) tiotropium
 - (c) formoterol
 - (d) salmeterol
 - (e) ipratropium
4. A patient recently diagnosed with COPD underwent extensive spirometry prior to initiation of medical treatment. Based on the testing results, it is determined that he has moderate COPD. Which of the following treatment regimens is appropriate?
 - (a) No medical therapy is indicated at this time.
 - (b) albuterol as needed.
 - (c) tiotropium 18 μ g daily
 - (d) tiotropium 18 μ g daily plus albuterol as needed
 - (e) prednisone 20 mg daily plus tiotropium 18 μ g daily plus albuterol as needed
5. Which of the following best characterizes the role of tiotropium in COPD therapy?
 - (a) It can provide symptomatic relief of COPD.
 - (b) It can reverse the progression of COPD.

- (c) It can slow the progression of COPD.
- (d) It can halt the progression of COPD.
- (e) It can reduce the frequency of COPD exacerbations.

6. Which of the following adverse effects is most commonly associated with tiotropium?
 - (a) dry cough
 - (b) dry mouth
 - (c) rebound bronchoconstriction
 - (d) tachycardia
 - (e) blurred vision
7. Tiotropium is available in which of the following dosage forms?
 - (a) pressurized MDI
 - (b) dry powder capsules for use in the HandiHaler device
 - (c) solution for nebulization
 - (d) capsules for oral administration
 - (e) dry powder Diskus inhaler
8. Which of the following best describes the advantage of tiotropium compared with ipratropium?
 - (a) improved lung function
 - (b) reduction in the use of rescue medication
 - (c) reduction in symptoms
 - (d) improved quality of life
 - (e) reduction in dosing frequency
9. A relative contraindication to using tiotropium is:
 - (a) hepatic dysfunction.
 - (b) age >65 years.
 - (c) dementia.
 - (d) Parkinson's disease.
 - (e) narrow-angle glaucoma.
10. A male patient is beginning therapy with tiotropium. The physician measures the man's pulmonary function before and for 3 hours after the first dose. The improvement in lung function is modest and does not meet the threshold of 200 mL for clinically important change. Which of the following is a rational therapeutic plan for this patient?
 - (a) Continue tiotropium because clinical improvement can still be achieved.
 - (b) Switch to ipratropium because it has been on the market longer and is known to be efficacious.
 - (c) Add salmeterol because the patient is progressing to severe COPD.
 - (d) Increase the tiotropium dose to 18 μ g twice daily, because this is the optimal dose for nonresponders.
 - (e) Add ipratropium because its effects are additive to tiotropium.
11. In many placebo- and active-controlled clinical trials, the primary outcome was the effect of tiotropium on trough FEV₁ after chronic administration. Which of the following best summarizes the impact of tiotropium on this outcome?
 - (a) Tiotropium produced clinically, but not statistically, significant improvements versus placebo.
 - (b) Tiotropium produced statistically, but not clinically, significant improvements versus placebo.

- (c) Tiotropium produced neither statistically nor clinically significant improvements versus placebo.
- (d) Tiotropium produced statistically, but not clinically, significant improvements versus ipratropium.
- (e) Tiotropium produced statistically, but not clinically, significant improvements versus salmeterol.

12. HRQoL is an important factor to consider in evaluating the efficacy of pharmacologic therapy for COPD. Clinical studies evaluating effect of tiotropium on HRQoL concluded that:

- (a) tiotropium is superior to ipratropium.
- (b) tiotropium is superior to salmeterol.
- (c) there was no consistent advantage with tiotropium compared with ipratropium or salmeterol.
- (d) ipratropium is superior to tiotropium.
- (e) salmeterol is superior to tiotropium.

13. A patient with COPD is using inhaled salmeterol 50 µg twice daily and albuterol as needed (typically 2 puffs 6–8 times a day). If salmeterol was replaced by tiotropium 18 µg daily, what would be the expected effect on the patient's albuterol use?

- (a) 50% increase
- (b) 50% decrease
- (c) termination
- (d) no change
- (e) effect is variable

14. Which of the following best characterizes the effect of tiotropium on exercise tolerance?

- (a) It produces no important change.
- (b) It improves inspiratory capacity but does not affect symptoms.
- (c) It worsens inspiratory capacity but improves symptoms.
- (d) It produces both functional and symptomatic improvements.
- (e) It has no effect on inspiratory capacity but improves symptoms.

15. Which of the following are benefits of tiotropium over other agents?

- (a) ability to administer the capsules orally or by inhalation with the HandiHaler device
- (b) indication for treatment of both COPD and asthma
- (c) ease of use with the dry powder formulation
- (d) cost-savings from removing ipratropium from the formulary
- (e) lower administration costs owing to once-daily administration

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EFALIZUMAB FOR PSORIASIS

Goal

To review the pharmacology, efficacy, and safety of efalizumab for the treatment of moderate to severe plaque psoriasis.

Objectives

After reviewing this article, the reader should be able to:

1. describe the pharmacology and pharmacokinetics of efalizumab;
2. recall the clinical evidence demonstrating the efficacy of efalizumab in psoriasis;
3. apply the results of clinical studies to specific patients with psoriasis;
4. discuss the risks associated with efalizumab.

Test Questions

1. Efalizumab is a monoclonal antibody that binds:

- (a) CD11a.
- (b) TNF- α .
- (c) E-selectin.
- (d) interferon gamma.
- (e) CD3.

2. The mechanism of efalizumab in psoriasis involves:

- (a) decreasing the number of T cells.
- (b) changing the cytokine profile from T1 to a T2 subtype.
- (c) inactivating cytokines.
- (d) inhibiting T-cell activation and migration.
- (e) increasing the number of T cells.

3. At steady-state, the mean half-life of efalizumab is:

- (a) 1–3 hours.
- (b) 1–2 days.
- (c) 7–10 days.
- (d) 14 days.
- (e) 25 days.

4. The time to relapse after discontinuation of efalizumab in clinical trials was on average:

- (a) 1 week.
- (b) 2 weeks.
- (c) 4 weeks.
- (d) 12 weeks.
- (e) 24 weeks.

5. In addition to psoriasis, efalizumab has possible benefit in patients with:

- (a) rheumatoid arthritis.
- (b) ulcerative colitis.
- (c) allergic asthma.
- (d) psoriatic arthritis.
- (e) Crohn's disease.

6. Which of the following will most likely be monitored throughout therapy?

- (a) platelet counts
- (b) alanine aminotransferase
- (c) hemoglobin
- (d) pulmonary function tests
- (e) tuberculosis antigen

7. Efalizumab should be administered as:

- (a) an intramuscular injection.
- (b) an intravenous injection over one hour.
- (c) an intravenous bolus injection.
- (d) a subcutaneous injection.
- (e) an intradermal injection.

8. Based on clinical trial information, which of the following patients is best suited to receive efalizumab?

- (a) 50-year-old patient with severe hepatic dysfunction
- (b) 50-year-old patient on dialysis
- (c) 85-year-old patient with macular degeneration
- (d) 15-year-old otherwise healthy individual
- (e) 60-year-old patient with rheumatoid arthritis being treated with etanercept

9. What is the main test that is used in clinical trials to determine efficacy of psoriasis agents?

- (a) PASI
- (b) overall lesion severity scale
- (c) dermatology life quality index
- (d) itching visual analog scale
- (e) physician's global assessment

Questions 10–12 refer to the following case:

A 68-year-old man who is 178 cm tall and weighs 91 kg has a medical history significant for type 2 diabetes, high cholesterol level, and psoriasis. The patient reports poor quality of life. Approximately 15% of his body surface area is involved.

10. What would be the appropriate dose of efalizumab for this patient?

- (a) 90 mg subcutaneously once a week
- (b) 180 mg subcutaneously once a week
- (c) 180 mg subcutaneously every other week
- (d) 200 mg subcutaneously every other week
- (e) 300 mg subcutaneously once a week

11. Two weeks after initiation of efalizumab, the patient is experiencing headache, myalgia, and nausea. What is an appropriate step to take in light of these events?

- (a) Discontinue efalizumab and switch to another biologic agent.
- (b) Continue efalizumab and treat symptoms with acetaminophen.
- (c) Change dosage regimen to every other week.
- (d) Halve the dosage and continue efalizumab weekly.
- (e) Continue efalizumab and treat symptoms with systemic corticosteroids.

12. After 12 weeks of efalizumab therapy, the patient has reached a 60% reduction in the PASI. A decision about whether to continue efalizumab needs to be made. Based on results of the available clinical trials, what is the best option?

- (a) Discontinue efalizumab and switch to another biologic agent.
- (b) Double the dose of efalizumab for another 12 weeks and then re-evaluate.
- (c) Continue the current regimen for another 12 weeks and then re-evaluate.
- (d) Add another biologic agent for combination therapy.

- (e) Double the dose of efalizumab, administer every other week for 12 weeks, and then reevaluate.

13. Which of the following statements regarding efalizumab is *true*?

- (a) Dosage adjustments are required in the elderly.
- (b) It has been approved for patients <18 years of age.
- (c) It is classified as pregnancy category C.
- (d) Clearance is not affected by body weight, gender, or race.

- (e) Dosage adjustments are required in hepatic impairment.

14. Administration instructions for patients receiving efalizumab should include which of the following statements?

- (a) Take with food to increase absorption.
- (b) Discontinue therapy if you experience flu-like symptoms.
- (c) Administer the injection at the same site each week.
- (d) A tuberculosis test is required yearly.

- (e) Report any unusual bleeding or bruising to your physician.

15. From clinical trials, a reasonable estimate of the percentage of patients who will reach PASI 75% on the approved FDA dosage regimen is:

- (a) 0–10%.
- (b) 20–30%.
- (c) 40–50%.
- (d) 60–70%.
- (e) 80–90%.