

# PharmaCE™

a continuing education program for *JPT* readers

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## November/December CE Questions

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### ACCREDITATION

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ACPE Universal Program Number 407-000-06-056-H01

Expires: 12/31/09

### ABATACEPT (see page 336)

#### Goal

To present information on the epidemiology, etiology, clinical presentation, diagnosis, treatment, and monitoring of RA, with a focus on the newest advancement in pharmacologic treatment of the disease, to assist pharmacists in providing optimal pharmaceutical care to patients with RA.

#### Objectives

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

1. describe the pathophysiology and clinical presentation of RA;
2. identify the pharmacologic agents used in the treatment of RA;
3. describe the mechanism of action of abatacept;
4. identify the clinical benefits observed with the use of abatacept;
5. explain the role of abatacept in the treatment of RA.

#### Test Questions

1. RA is a chronic inflammatory autoimmune disease believed to be driven by:
  - (a) T cell activation.
  - (b) B cell activation.
  - (c) mast cell activation.
  - (d) red blood cell activation.
2. RA is:
  - (a) defined by asymmetrical inflammation of multiple joints throughout the body.
  - (b) associated with certain risk factors such as age, gender, environmental factors, and genetic predisposition.
  - (c) diagnosed at a younger age in males than females.
  - (d) a disease whose onset of symptoms occurs in the first to third decade of life.
3. Patients with RA seem to have an increased prevalence of which of the following alleles?

- (a) HLA-DR1 and DR4
- (b) HLA-DR1 and DR2
- (c) HLA-DR2 and DR5
- (d) HLA-DR3 and DR6

4. The *main* costimulatory pathway of interest in RA involves the:
  - (a) CD16 protein.
  - (b) CD28 protein.
  - (c) CD40 protein.
  - (d) CD80 protein.
5. All of the following are pharmacologic treatment options for RA *except*:
  - (a) interferons.
  - (b) NSAIDs.
  - (c) DMARDs.
  - (d) TNF antagonists.
6. Abatacept is a new pharmacologic agent approved for use in adults with:
  - (a) mild-to-moderate RA who are on no other pharmacologic treatment.
  - (b) mild-to-moderate RA who are concomitantly on a glucocorticoid.
  - (c) mild-to-moderate RA who are concomitantly on a DMARD and a glucocorticoid.
  - (d) moderate-to-severe RA who have had inadequate responses to one or more DMARDs or TNF antagonists.
7. Chemically, abatacept is a:
  - (a) CTLA1-Ig.
  - (b) CTLA2-Ig.
  - (c) CTLA3-Ig.
  - (d) CTLA4-Ig.
8. Abatacept consists of:
  - (a) 1 portion containing the human CTLA4 receptor protein.
  - (b) 1 portion containing a constant region of human IgG1.
  - (c) 2 portions containing a human CTLA4 receptor protein and a constant region of human IgG1.
  - (d) 2 portions containing constant regions of human IgG1.
9. Which of the following mechanisms of action represents that of abatacept?
  - (a) Abatacept nonselectively binds to the CD16 and CD28 proteins on the APC, thereby blocking CD80 and inhibiting T cell activation.
  - (b) Abatacept nonselectively binds to the CD28 and CD80 proteins on the APC, thereby blocking CD86 and inhibiting T cell activation.
  - (c) Abatacept nonselectively binds to the CD28 and CD86 proteins on the APC, thereby blocking CD80 and inhibiting T cell activation.
  - (d) Abatacept nonselectively binds to the CD80 and CD86 proteins on the APC, thereby blocking CD28 and inhibiting T cell activation.
10. By inhibiting T cell activation, abatacept also inhibits T cell function, which results in:
  - (a) reduced T cell proliferation, cytokine release, and autoantibody production by B cells.

Answer sheet appears on page 378.

- (b) reduced T cell proliferation, increased cytokine release, and increased autoantibody production by B cells.
- (c) reduced T cell proliferation, reduced cytokine release, and increased autoantibody production by B cells.
- (d) increased T cell proliferation, increased cytokine release, and reduced autoantibody production by B cells.

11. A patient receiving abatacept may be at increased risk for developing all of the following types of infection *except*:
- (a) upper respiratory illnesses.
  - (b) bronchitis.
  - (c) tuberculosis.
  - (d) varicella zoster.

Questions 12 and 13 refer to the following case:

A 30-year-old female (weight 70 kg) with RA has failed therapy with 2 DMARDs and a TNF antagonist. Her physician decides to initiate abatacept for her progressive symptoms.

12. What dose should be recommended for this patient?
- (a) 250 mg
  - (b) 500 mg
  - (c) 750 mg
  - (d) 1,000 mg
13. After the initial dose, when should subsequent doses of abatacept be given?
- (a) at weeks 1 and 3, and every 3 weeks thereafter
  - (b) at weeks 1 and 4, and every 4 weeks thereafter
  - (c) at weeks 2 and 3, and every 3 weeks thereafter
  - (d) at weeks 2 and 4, and every 4 weeks thereafter
14. What are the appropriate recommendations for the administration of abatacept?
- (a) Each dose should be administered as an intravenous infusion over 10 minutes.
  - (b) Each dose should be administered as an intravenous infusion over 20 minutes.
  - (c) Each dose should be administered as an intravenous infusion over 30 minutes.
  - (d) Each dose should be administered as an intravenous infusion over 40 minutes.
15. All of the following are measures of assessing RA disease activity used by the American College of Rheumatology *except*:
- (a) number of tender and swollen joints.
  - (b) number of drugs being used for treatment.
  - (c) acute-phase reactant values.
  - (d) patient's assessment of pain, physical function, and overall disease activity.

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ACPE Universal Program Number 407-000-06-057-H01  
Expires: 12/31/09

**FEBUXOSTAT**  
(see page 342)

**Goal**

To review the pharmacology and clinical data for febuxostat in the treatment of gout and hyperuricemia, assisting pharmacists in evaluation of the potential role of febuxostat in the treatment of gout.

**Objectives**

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

1. discuss the mechanism of action of febuxostat;
2. discuss the major findings of the Phase II febuxostat study and the FACT;
3. compare the efficacy of febuxostat with that of allopurinol;
4. list 2 common adverse events associated with febuxostat;
5. discuss the potential role of febuxostat in treating gout.

**Test Questions**

1. Which of the following statements regarding gout is *true*?
  - (a) Gout is the most common cause of inflammatory arthritis in women younger than 40 years of age.
  - (b) Approximately 1 million people reported a diagnosis of gout by a physician in the National Health and Nutrition Examination Survey III.
  - (c) Gout is a heterogeneous disorder that can progress through 4 clinical phases if untreated.
  - (d) Acute gout occurs when calcium pyrophosphate crystals deposit in joints or other connective tissues.
2. Signs or symptoms associated with acute gout include which of the following?
  - (a) podagra and warmth at affected joint(s)
  - (b) hyperuricemia and gradual onset of mild pain
  - (c) inflammation and limited range of motion
  - (d) Both a and c are correct.
3. What is the established method for definitive diagnosis of gout?
  - (a) redness over joints
  - (b) asymptomatic swelling within a joint on radiograph
  - (c) monosodium urate crystals in synovial fluid during an acute attack
  - (d) synovial fluid culture negative for organism during an acute attack
4. The use of urate-lowering therapy may be considered:
  - (a) in patients with asymptomatic hyperuricemia.
  - (b) in patients after 1 episode of acute gout.
  - (c) in patients with serum urate level of 6 mg/dL or less.
  - (d) in patients with tophi.
5. Which of the following statements is *true*?
  - (a) Allopurinol is a nonpurine xanthine oxidase inhibitor.
  - (b) Febuxostat is a nonpurine xanthine oxidase inhibitor.
  - (c) Febuxostat is a purine xanthine oxidase inhibitor.
  - (d) Probenecid is a nonpurine xanthine oxidase inhibitor.
  - (e) Probenecid is a purine xanthine oxidase inhibitor.
6. Which of the following statements is *true*?
  - (a) Febuxostat clearance was minimally affected in those with mild-to-moderate hepatic impairment.
  - (b) Febuxostat appears to be safe in those with severe hepatic impairment.
  - (c) Febuxostat elimination occurs primarily by the kidneys.
  - (d) Febuxostat dose adjustment based on renal function may be necessary.
7. In the Phase II febuxostat study, which dose of febuxostat was *most* effective in lowering serum urate levels?
  - (a) 20 mg
  - (b) 40 mg
  - (c) 80 mg
  - (d) 120 mg

8. Which statement regarding the phase 2 febuxostat study is *true*?
- Febuxostat was more effective than placebo in achieving serum uric acid concentrations of less than 6.0 mg/dL.
  - The incidence of gouty arthritis flares was higher with febuxostat 40 mg than placebo.
  - The incidence of gouty arthritis flares was higher with febuxostat 80 mg and 120 mg than with placebo.
  - Both a and c are correct.
9. In the FACT, which drug and dose were associated with the highest frequency of gout flares requiring treatment during the 8 week prophylaxis period?
- febuxostat 40 mg
  - febuxostat 80 mg
  - febuxostat 120 mg
  - allopurinol 300 mg
10. Which statement regarding the FACT is *true*?
- At the final visit, the mean percent serum uric acid reduction from the baseline was significantly greater with febuxostat compared with allopurinol.
  - Drug discontinuation rates were higher with allopurinol than with febuxostat.
  - During weeks 9 through 52, more patients receiving allopurinol required treatment for at least one gout flare.
  - The percentage reduction in tophus area was greater with febuxostat.
11. In the FACT, the most common adverse event leading to withdrawal was:
- abdominal pain.
  - abnormal liver function test results.
  - diarrhea.
  - headache.
12. Which of the following statements is true?
- Febuxostat appears to be less effective than allopurinol in lowering serum uric acid levels to below 6 mg/dL.
  - Febuxostat has been shown to reduce the recurrence of acute gout compared with placebo.
  - Febuxostat does not interact with azathioprine or 6-mercaptopurine.
  - A new drug application with has been submitted for approval of febuxostat 80 and 120 mg.
13. Based on the available literature, febuxostat may be preferred in patients:
- who have contraindications to allopurinol use.
  - who have renal insufficiency.
  - who have severe liver damage.
  - Both a and b are correct.
- Questions 14 and 15 refer to the following case:
- A 55-year-old man presents to the walk-in clinic with complaints of severe pain and swelling of his right big toe since the previous night. The man is obese and his toe is warm and tender to touch. He denies any significant past medical history. He states that he had gone to a party last night and drank more alcohol than usual.
14. What are this patient's risk factors for developing gout?
- obesity
  - sex
  - alcohol intake
  - All of the above are correct.
15. What is the ideal treatment for this patient?
- allopurinol
  - febuxostat
  - probenecid
  - None of the above is an appropriate treatment.