

# Hodgkin's Disease: Review Questions

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## QUESTIONS

Choose the single best answer for each question.

- 1. Which of the following is associated with Hodgkin's disease?**
  - (A) Cytomegalovirus
  - (B) Epstein-Barr virus (EBV)
  - (C) *Helicobacter pylori*
  - (D) Human herpes virus 8
  - (E) Measles virus
- 2. A 26-year-old woman just completed therapy for Hodgkin's disease with doxorubicin, bleomycin, vinblastine, and dacarbazine, followed by radiation therapy to the neck and mediastinum. All of the following are potential long-term complications of this treatment regimen EXCEPT**
  - (A) Acute myelogenous leukemia (AML)
  - (B) Breast cancer
  - (C) Hypothyroidism
  - (D) Melanoma
  - (E) Valvular heart disease
- 3. A 38-year-old man was recently diagnosed with stage II (mediastinal and supraclavicular lymph node involvement) nodular sclerosis Hodgkin's disease. The largest lymph node measures 5 cm in diameter. He has lost 5 lb since his diagnosis 4 weeks ago. Which of the following is associated with a less favorable prognosis in this patient?**
  - (A) Age
  - (B) Gender
  - (C) Histologic subtype (ie, nodular sclerosis)
  - (D) Mediastinal involvement
  - (E) Weight loss
- 4. All of the following are correct pairings of a chemotherapy agent with a potential side effect EXCEPT**
  - (A) Bleomycin can induce pneumonitis
  - (B) Bleomycin can induce Raynaud's phenomenon
  - (C) Dacarbazine can cause hemorrhagic cystitis
  - (D) Doxorubicin can cause cardiomyopathy
  - (E) Vinblastine can cause constipation

*(turn page for answers)*

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## ANSWERS AND EXPLANATIONS

1. **(B) EBV.** Exposure to EBV, particularly infectious mononucleosis in the preteen and teenage years, is associated with a 2.5- to 7-fold increased risk of Hodgkin's disease.<sup>1</sup> EBV DNA can be detected in 25% to 50% of classic Hodgkin's disease.<sup>2</sup> However, millions of people have been exposed to EBV, while only 7500 cases of Hodgkin's disease occur annually in the United States; therefore other factors must be at play. Cytomegalovirus is not associated with a particular cancer but can cause lung, liver, and intestinal infections (among others) in bone marrow transplant recipients. *H. pylori* is associated with marginal zone lymphoma. Human herpes virus 8 is associated with Kaposi's sarcoma, Castleman's disease, and primary effusion lymphoma, particularly in HIV-positive patients. Measles virus is not associated with malignancy.
2. **(D) Melanoma.** Radiation exposure is associated with nonmelanoma skin cancers but not melanoma. Radiation to the mediastinum is associated with valvular as well as pericardial, myocardial, and coronary artery disease. This patient will need aggressive monitoring for and modification of cardiac risk factors, such as diabetes mellitus, hypertension, and hypercholesterolemia. Hypothyroidism is common in patients receiving radiation to the neck or mediastinum. The risk of breast cancer after radiation to the mediastinum is highest in women younger than age 30 years and is particularly high in peripubertal young women.<sup>3</sup> Secondary AML is more common with older, nitrogen mustard-containing chemotherapy regimens for Hodgkin's disease but does occur in about 1.3% of patients after treatment with doxorubicin, bleomycin, vinblastine, and dacarbazine and radiation.<sup>4</sup> Secondary solid tumors (eg, breast cancer, skin cancer, lung cancer) usually take a decade or more after therapy to develop, while most cases of AML will occur within 5 years after therapy is completed.
3. **(B) Gender.** Males have a slightly worse outcome than females treated for Hodgkin's disease,<sup>5</sup> which may reflect sex hormone-induced differences in the metabolism of chemotherapy agents. Involvement of the mediastinum is not associated with a worse prognosis, nor is the nodular sclerosis subtype of Hodgkin's disease. Age older than 40 or 45 years is associ-

ated with worse prognosis, but this patient is younger than 40 years. Weight loss of more than 10% of body weight is an adverse feature, but this patient had lost only 5 lb in a month, which is not likely to be greater than 10% of the body weight of a 38-year-old man. Bulky lymphadenopathy (> 10 cm or > one third of the thoracic diameter) is also an adverse feature, but this patient does not meet criteria for bulky disease.

4. **(C) Dacarbazine can cause hemorrhagic cystitis.** Cyclophosphamide can cause hemorrhagic cystitis but dacarbazine does not. Doxorubicin can cause cardiomyopathy, usually at cumulative lifetime doses of greater than 450 mg/m<sup>2</sup>.<sup>6</sup> Patients receiving doxorubicin should have a baseline cardiac evaluation with either a multiple gated acquisition scan or echocardiogram. Bleomycin can cause acute or delayed pneumonitis. Patients should be assessed for cough or shortness of breath and should have baseline pulmonary function testing prior to receiving bleomycin as well as periodic repeat pulmonary function testing while receiving the drug. Bleomycin can also rarely induce Raynaud's phenomenon. Vinblastine causes constipation as well as peripheral neuropathy.

## REFERENCES

1. Alexander FE, Jarrett RF, Lawrence D, et al. Risk factors for Hodgkin's disease by Epstein-Barr virus (EBV) status: prior infection by EBV and other agents. *Br J Cancer* 2000;82:1117–21.
2. Weiss LM, Strickler JG, Warnke RA, et al. Epstein-Barr viral DNA in tissues of Hodgkin's disease. *Am J Pathol* 1987;129:86–91.
3. Aisenberg AC, Finkelstein DM, Doppke KP, et al. High risk of breast carcinoma after irradiation of young women with Hodgkin's disease. *Cancer* 1997;79:1203–10.
4. Delwail V, Jais JP, Colonna P, Andrieu JM. Fifteen-year secondary leukaemia risk observed in 761 patients with Hodgkin's disease prospectively treated by MOPP or ABVD chemotherapy plus high-dose irradiation. *Br J Haematol* 2002;118:189–94.
5. Hasenclever D, Diehl V. A prognostic score for advanced Hodgkin's disease. International Prognostic Factors Project on Advanced Hodgkin's Disease. *N Engl J Med* 1998; 339:1506–14.
6. Hortobagyi GN, Frye D, Buzdar AU, et al. Decreased cardiac toxicity of doxorubicin administered by continuous intravenous infusion in combination chemotherapy for metastatic breast carcinoma. *Cancer* 1989;63:37–45.

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