

A 9-year-old African-American boy is brought to ER with high fever, poor appetite, and irritability. His heart rate is 140/min and his blood pressure is 80/60 mmHg. He has been hospitalized several times before for poorly localized abdominal pain. He also has a history of hematuria. The boy has not received several routine vaccinations because his mother is afraid that they will cause autism. His hematocrit is 22% and the reticulocyte count is 12%. The patient dies several hours after the admission. This patient's death may have been prevented by:

- ☐ A. Folic acid supplementation
- ☐ B. Vaccination with a live attenuated virus
- ☐ C. Vaccination with a bacterial toxoid
- ☐ D. Vaccination with a conjugate capsular polysaccharide
- ☐ E. Periodic blood transfusions



A 9-year-old African-American boy is brought to ER with high fever, poor appetite, and irritability. His heart rate is 140/min and his blood pressure is 80/60 mmHg. He has been hospitalized several times before for poorly localized abdominal pain. He also has a history of hematuria. The boy has not received several routine vaccinations because his mother is afraid that they will cause autism. His hematocrit is 22% and the reticulocyte count is 12%. The patient dies several hours after the admission. This patient's death may have been prevented by:

- ☐ A. Folic acid supplementation [4%]
- ☐ B. Vaccination with a live attenuated virus [6%]
- ☐ C. Vaccination with a bacterial toxoid [5%]
- ☒ D. Vaccination with a conjugate capsular polysaccharide [73%]
- ☐ E. Periodic blood transfusions [12%]

[Proceed to Next Item](#)**Explanation:**User Id: XXXXXXXXXX

This patient's history and presentation are consistent with sickle cell anemia complicated by an acute bacterial infection. We can assume he has sickle cell anemia based upon his anemia with a high reticulocyte count, previous admissions for pain, hematuria, and ethnicity. Patients with sickle cell anemia become functionally hyposplenic at an early age due to splenic autoinfarction. Thus, they are more susceptible than other patients to infection with encapsulated organisms, such as *S. pneumoniae*, *H. influenzae*, and *N. meningitidis*. Vaccination with the conjugated *S. pneumoniae* vaccine decreases the incidence of invasive infections caused by this organism. Twice daily administration of prophylactic penicillin should also be given to children with sickle cell disease until they reach five years of age.

**(Choice A)** Folic acid supplementation has often been recommended for patients suffering from sickle cell anemia. This practice has recently come into question over fears that folic acid supplementation may conceal vitamin B12 deficiency. However, regardless of this controversy, folic acid administration would not have prevented this patient's infection.

**(Choice B)** The common vaccinations of childhood that use live attenuated viruses are those for measles, mumps, rubella, and chicken pox.

**(Choice C)** The common vaccinations of childhood that use bacterial toxoids include



- ☐ B. Vaccination with a live attenuated virus [6%]
- ☐ C. Vaccination with a bacterial toxoid [5%]
- ☒ D. Vaccination with a conjugate capsular polysaccharide [73%]
- ☐ E. Periodic blood transfusions [12%]

[Proceed to Next Item](#)**Explanation:**User Id: [REDACTED]

This patient's history and presentation are consistent with sickle cell anemia complicated by an acute bacterial infection. We can assume he has sickle cell anemia based upon his anemia with a high reticulocyte count, previous admissions for pain, hematuria, and ethnicity. Patients with sickle cell anemia become functionally hyposplenic at an early age due to splenic autoinfarction. Thus, they are more susceptible than other patients to infection with encapsulated organisms, such as *S. pneumoniae*, *H. influenzae*, and *N. meningitidis*. Vaccination with the conjugated *S. pneumoniae* vaccine decreases the incidence of invasive infections caused by this organism. Twice daily administration of prophylactic penicillin should also be given to children with sickle cell disease until they reach five years of age.

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**(Choice B)** The common vaccinations of childhood that use live attenuated viruses are those for measles, mumps, rubella, and chicken pox.

**(Choice C)** The common vaccinations of childhood that use bacterial toxoids include tetanus and diphtheria. This patient is not presenting with signs or symptoms consistent with tetanus or diphtheria.

**(Choice E)** Periodic blood transfusions do not decrease the incidence of infection in patients with sickle cell anemia.

**Educational Objective:**

Pneumococcal vaccination plus penicillin prophylaxis can prevent almost all cases of pneumococcal sepsis in patients with sickle cell anemia.

Time Spent: 2 seconds

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