Screening for Inhalational Anthrax after a Bioterrorist Attack

What is the problem and what is known about it so far?
Anthrax is an infectious disease caused by bacteria that can survive for years as spores. It is usually found in animals, such as cattle, sheep, and goats. Although human cases are uncommon in the United States, humans can get anthrax by touching, eating, or inhaling spores from infected animal products. Recently, anthrax was deliberately spread to humans when spores were sent through the mail.

Inhaling spores leads to serious, often fatal, illness. Initial symptoms may seem like those of a cold, but they quickly progress to severe problems with breathing. Antibiotics are sometimes effective, but early diagnosis and treatment are important because the disease progresses so rapidly. Early identification of inhalational anthrax has been considered difficult because of concern that early symptoms resemble those of other common respiratory tract (mouth and nose or airways and lungs) infections, such as the flu.

Why did the researchers do this particular study?
To study differences between symptoms of inhalational anthrax and common viral respiratory tract infections.

Who was studied?
28 patients with inhalational anthrax and 4694 patients with the flu or other viral respiratory illnesses similar to flu.

How was the study done?
The authors reviewed published reports from 1920 to 2001 that described symptoms of 28 patients with inhalational anthrax. They also reviewed 5 studies that reported symptoms of 4694 patients with viral respiratory infections. Then, they compared the frequency of different symptoms and physical examination findings among groups. By dividing the frequency of the symptom in anthrax by its frequency in the other illnesses, the authors obtained a measure (positive likelihood ratio) of how well the symptom helped distinguish anthrax from the other illness.

What did the researchers find?
Several symptoms were associated with a greater likelihood of anthrax than of respiratory viral infections. The most useful were loss of consciousness, mental confusion, shortness of breath, and nausea and vomiting. Sore throat and runny nose more often indicated viral infection than anthrax. Fever and cough were common in both infections.

What were the limitations of the study?
The researchers obtained information about symptoms from several reports. Authors of the reports may not have assessed the presence or absence of symptoms in a similar manner. If authors did not report symptoms, the researchers assumed that the symptom was not present. Also, the study helps discern symptoms that may be more or less likely in patients with inhalational anthrax, but it doesn’t give actual probabilities of anthrax in patients with different symptoms.

What are the implications of the study?
In the event of a bioterrorist attack, several symptoms, including mental confusion, loss of consciousness, shortness of breath, and nausea and vomiting, may help distinguish inhalational anthrax from respiratory viral illness.