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Matthew Meselson <msmeselson@gmail.com>

Review 1900-2005: Children with anthrax atch (Bravata et al)

1 message

Daniel Lucey <dlucey@columbus.rr.com> **Mon, May 2, 2011 at 6:22 PM**
To: msmeselson@gmail.com
Cc: jeg@mit.edu, "drl23@georgetown.edu Richard Lucey" <drl23@georgetown.edu>

Dear Professor Meselson (Mathew),

it was a pleasure talking with you this late afternoon regarding 1979 events and anthrax in general.

Please find attached the pdf article by Bravata, Holty, Wang et al in Arch Pediatr Adolesc Med 2007 (Sept) 161: 896-905 that we discussed reviewing anthrax in children 1900-2005. The first page is printed out below in case you cannot open the attachment.

The three main questions I have about the five survivors whose hospital records you and Alexis Shelokov transcribed that night in Moscow in 1992 via younger Vladimir Nikiforov (as stated on page 160 of Jeanne's 1999 book on Sverdlovsk) are:

1). What was the laboratory evidence for the diagnosis of anthrax in each of the survivors? For example, a blood culture or culture of *Bacillus anthracis* from any other party of the body? I am sure that Hospital 40 had a microbiology laboratory that could grow and identify *B. anthracis* (per the 1993 PNAS paper by Dr. Abramova et al describing the 42 autopsies).

2). Was the fluid around the lungs (termed "pleural fluid") drained in the survivors (and some of the patients who died)? If this fluid was drained from around the lungs, how often was it drained and what drainage equipment was used (e.g., "chest tube" or "thoracentesis")?

3). What antibiotics were used to treat the survivors, and non-survivors in addition to tetracycline? For example, what doses of penicillin, chloramphenicol, and/or other antibiotics were used? Did the survivors receive any different type or dose or frequency of antibiotics than the non-survivors?

If you find these five survivors hospital records that you and Alexis transcribed in Moscow, I would greatly appreciate the opportunity to come to Boston to read these medical records over in detail, as early as next week (May 9, 10, 11, or 12), or whenever is convenient. Tomorrow I will be on a call with Art Friedlander and a small group (< 10 persons) who have a strong interest in anthrax preparedness.

Also, this Wednesday I will be on a phone call with Art and two people from an Institute of Medicine committee that I am serving on to discuss related issues.
Thus, I greatly appreciate our discussion today and any further information you might be able to find and share from your archives related to Sverdlovsk.

I have also read and cross-referenced with your 1994 Science paper each patient named in Jeanne's 1999 book. I hope the three of us do have an opportunity to talk over dinner some Boston evening soon, as you suggested.

With appreciation,

Dan

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REVIEW ARTICLE

Inhalational, Gastrointestinal, and Cutaneous Anthrax in Children

A Systematic Review of Cases: 1900 to 2005

Dena M. Bravata, MD, MS; Jon-Erik C. Holty, MD, MS; Ewen Wang, MD; Robyn Lewis, MA; Paul H. Wise, MD, MPH; Kathryn M. McDonald, MM; Douglas K. Owens, MD, MS

Objective: To systematically review all published case reports of children with anthrax to evaluate the predictors of disease progression and mortality.

Data Sources: Fourteen selected journal indexes (1900-1966), MEDLINE (1966-2005), and the bibliographies of all retrieved articles.

Study Selection: Case reports (any language) of anthrax in persons younger than 18 years published between January 1, 1900, and December 31, 2005.

Main Exposures: Cases with symptoms and culture or Gram stain or autopsy evidence of anthrax infection.

Main Outcome Measures: Disease progression, treatment responses, and mortality.

Results: Of 2499 potentially relevant articles, 73 case reports of pediatric anthrax (5 inhalational cases, 22 gastrointestinal cases, 37 cutaneous cases, 6 cases of primary meningoencephalitis, and 3 atypical cases) met the inclusion criteria. Only 10% of the patients were younger than 2 years, and 24% were girls. Of the few children with inhalational anthrax, none had nonheadache neurologic symptoms, a key finding that distinguishes adult inhalational anthrax from more common illnesses, such as influenza. Overall, observed mortality was 60% (3 of 5) for inhalational anthrax, 65% (13 of 20) for gastrointestinal anthrax, 14% (5 of 37) for cutaneous anthrax, and 100% (6 of 6) for primary meningoencephalitis. Nineteen of the 30 children (63%) who received penicillinbased antibiotics survived, and 9 of the 11 children (82%) who received anthrax antiserum survived.

Conclusions: The clinical presentation of children with anthrax is varied. The mortality rate is high in children with inhalational anthrax, gastrointestinal anthrax, and anthrax meningoencephalitis. Rapid diagnosis and effective treatment of anthrax in children requires recognition of the broad spectrum of clinical presentations of pediatric anthrax.

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IN RESPONSE TO THE INTENTIONAL release of *Bacillus anthracis* by mail in 2001 there has been a proliferation of guidelines for the diagnosis and treatment of patients

with anthrax.[1-9] However, most of these guidelines have not specified diagnostic and management protocols for children. Children will likely be among the victims of future bioterrorism attacks on the general public, as they were during the 1995 sarin attack in Tokyo, Japan (which affected 16 children and 5 pregnant women), and the 1984 intentional *Salmonella* contamination of salad bars in Oregon (which affected numerous high school students).[10] In addition, children may be the specific targets of some terrorists, as they were during the unsuccessful 1995 plot to release a chlorine gas bomb in California's Disneyland.[11] Efforts to prepare for and respond to future attacks of anthrax bioterrorism will be aided by detailed information about the clinical presentation and treatment responses of pediatric populations exposed to anthrax.

Principally because of the paucity of pediatric cases in large case series of anthrax, observers have speculated that children are less susceptible to anthrax infection and may have different clinical courses after infection than adults. For example, during the 1979 Sverdlovsk outbreak, 70 patients developed clinical anthrax after an airborne release of spores[12,13]; however, there were no victims younger than 24 years reported, despite the fact that children were in the path of the plume.[14] Because there are no published studies synthesizing data from all reported pediatric cases of anthrax, it is unknown to what extent patient characteristics, early detec-

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