Project EQUIPP

Can Antibiotics Alone Protect a Population Against an Anthrax Attack?

Antibiotics have no effect on anthrax spores or the toxins produced by the organism.[1]

Per researchers at Johns Hopkins, the 60-day antibiotic treatment regimen currently recommended for post-exposure may not be enough to prevent anthrax in some cases.

- Spores can lay dormant in the host mammal for up to 60 days before germinating and attacking.[2]
- Anthrax spores can be detected in the lungs of monkeys (the best model for human disease) for at least 100 days after exposure.[3] This lingering threat can outlast antibiotic regiments
- An antibiotic course of 100 days is necessary to protect against infection induced by lingering spores that germinate later.

Anthrax (*Bacillus anthracis*) has been made to resist every recommended antibiotic available by prescription or stored in the Strategic National Stockpile.[7,8,9,10,11] **. Antibiotics affected include:**

- ciprofloxacin (Cipro®)[7,8,11] and oxfloxacin (Floxin®)[7,9,11]
- doxycycline [8,9] and tetracycline[8,9]
- penicillin G[7] and amoxicillin (Amoxil®)[7]
- ceftriaxone (Rocephin®)[7]
- vancomycin (Vancocin®)[7] and clindamycin (Cleocin®)[7]
- erythromycin[7,8] and azithromycin[8] (Zithromax®) and clarithromycin (Biaxin®)[7,8]

Patient adherence to long term antibiotic regiments is poor.[6]

- In the 2001 anthrax attacks, compliance and persistency to the prescribed 60-day course of Cipro® ranged from 21% of persons exposed at the Morgan postal facility in New York City to 64% of persons exposed at the Brentwood postal facility in Washington, D.C.[6]

Adverse events associated with antimicrobial prophylaxis in victims of the 2001 anthrax attacks were commonly reported.[6]

- Of the 5,343 persons who reported taking at least one dose of antibiotic, 57% (n=3,032) reported adverse events during the first 60 days of the prescribed regiment.[6]
- At the post 60-day follow-up, 16% (n=842) of respondents who took at least one dose of antibiotic reported seeking medical care for adverse events caused by the antibiotic.[6]

If not first used on civilians as a weapon, resistant anthrax strains may result from long term antibiotic regiments.

- Long term antibiotic therapy, as recommended for the treatment of exposure to anthrax might induce antimicrobial resistance in Bacillus anthracis by the selection of resistant mutants.[7,12]

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