FORENSIC EPIDEMIOLOGY IN ACTION – PLAGUE

A JOINT PUBLIC HEALTH/ FBI INVESTIGATION

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PLAGUE – (YERSINIA PESTIS) CLINICAL PRESENTATIONS

- **Bubonic**
  - Sudden onset fever, chills, weakness, headache + swollen, painful lymph nodes (buboes)

- **Septicemic**
  - Fever, chills, weakness, abdominal pain, shock, possible bleeding into skin and organs

- **Pneumonic**
  - Fever, headache, weakness, + rapidly developing pneumonia with SOB, chest pain, cough, bloody mucous

Source: http://www.cdc.gov/plague/symptoms/index.html

HUMAN PLAGUE CASES US & WORLDWIDE

LABORATORY RESPONSE NETWORK (LRN)

- 150 biological laboratories

- Mandatory proficiency testing program
  - Simulates real-world scenarios involving potential BT agents
  - Preparation, packaging, and distribution of biological material

- NJDOH Reporting and response
PLAGUE CASE STUDY

- Patient admitted with radiating chest pain x 2wks, history of back pain, normal CXR
- No fever
- CT scan showed mediastinal mass with pleural effusion
  - Pleural effusion identified Y. pestis
- Hospital laboratory calls NJDOH/CDS with a rule-out Y. pestis

CASE STUDY – INITIAL FINDINGS

- Incompatible clinical presentation
- Unclear epi features
  - Unclear country of origin, travel history / visitors
  - Recent layoff
  - Pets: bird and new dog
- Specimen approved for testing / LHD notified
  - PHEL (reference lab) confirmed Y. pestis
  - Isolate with original fluid sent to CDC (national lab)

Areas of Concern
- Atypical clinical presentation
- Laboratory confirmation
- Not found naturally in NJ
- No known travel history to endemic areas
- Recent job loss
- Language barrier
- CDS contacted FBI to discuss case/threat assessment
  * Joint public health/FBI interview

PUBLIC HEALTH / LAW ENFORCEMENT GOALS / OBJECTIVES

Public Health
- GOAL: To protect the public, to stop the spread of disease and to protect public health personnel

Law Enforcement
- GOAL: To protect public safety, to prevent a criminal act, to identify, apprehend and prosecute perpetrators and to protect law enforcement personnel

Interview Objectives:
1. Determine source of infection
2. Investigate possible bioterrorism linkages
3. Identify broader public health concerns

KEY INTERVIEW QUESTIONS

Public Health
- Travel history – US, international
- Clinical background
- Peruvian (or other) visitors
- Animal contact
- Ill close contacts

FBI
- Demeanor
  - Hiding or refusing to provide information
  - Delayed response, avoiding eye contact
- Awareness of suspicious people or activity
- Ill neighbors or coworkers
- Animal die-off
INTERVIEW FINDINGS

- No travel history
  - Daughter spent 2 months in Peru, returning that month

- No relevant clinical background
  - Chest pain, SOB since August

- Animal contact
  - Healthy parrot (≥ 5 yrs)
  - 2 month old healthy puppy, purchased 3 weeks prior
  - No other animal contact, no sightings of dead animals/rodents, no bug bites

- No ill close contacts / no visitors

CASE Solved

- Conference call with CDC/interested parties
  - CDC confirmatory testing identified *Y. pestis avirulent ALL-22*

- LRN Proficiency test sent to hospital 2 wks prior
  - Included *Y. pestis avirulent ALL-22*

- Epidemiological and law enforcement investigation was terminated

FINAL THOUGHTS

- Communication can work
  - Existing relationships

- Practice makes perfect
  - LRN/Epi Notification Protocols

- Epi/Law Enforcement training and exercises

Questions?

Thank you!

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