Tuberculosis: a Health Disparity Among Asians in Massachusetts as Compared to the General Population

BY SARAH NZIKOBA, STEPHANIE TRAN, PHUNG VUONG
WHAT IS TUBERCULOSIS (TB)?

http://www.medindia.net/patients/patientinfo/images/tuberculosis-tb.jpg

1 IN 3 PEOPLE INFECTED WITH TB BACTERIA

AN AIRBORNE NIGHTMARE
Tuberculosis symptoms

- Coughing
- Cough with blood
- Chest pain
- Weight loss
- Tiredness
- Fever
- Night sweats
- Chills
- Not feeling hungry

WHAT IS A HEALTH DISPARITY?

“The difference in the incidence, prevalence, mortality, and burden of disease and other adverse health conditions that exist among specific population groups in the United States.” (National Institutes of Health)
RISK FACTORS

- Host characteristic
  - Proximity
    - Duration of contact
  - Age
    - Gender
    - Immune status
    - Malnutrition
    - Diabetes

- Exposure
- Infection

- Crowding
  - Poor ventilation
  - Alcohol, smoking
  - Occupational risk

- Environmental and social factors
- Disease

Crowding
- Poor ventilation
- Alcohol, smoking
- Occupational risk
TB Risk Factor Distribution in Massachusetts

- Non-U.S. Born: 83%
- Substance Abuse: 9%
- Children < 15 y.o.: 3%
- HIV co-infection: 7%
- Homelessness: 4%
- Prison/Jail: 2%

*Total percentage is higher than 100%; some categories overlapped*
TB DISPARITY IN ASIANS

Percentage of TB Cases in Massachusetts in 2014

- Asian: 44%
- White, non-Hispanic: 15%
- Black, non-Hispanic: 24%
- Hispanic: 17%

Massachusetts Department of Public Health
TB Cases by Birthplace: Boston, 2011

- Asia: 35%
- Caribbean: 20%
- North America: 20%
- Africa: 15%
- Central/ South America: 10%
- Europe: 5%
IMMIGRATION

• Immigration is a social determinant of health
• Issues with the immigration process
• **Key issues at destination:**
  • Overcrowded working and living conditions
  • Language and cultural barriers
  • Lack of healthcare access

http://organizations.bloomu.edu/douglass/Images/GlobeHands.jpg
GENETIC FACTORS

• **IL-18 gene**
  - Activates macrophages - helps kill MTB
  - Polymorphisms alter IL-18 expression via binding of transcription factors

• **P2X7 receptor gene 1513 A→C polymorphism**
  - P2X7 receptor - induced by ATP to engulf and clear MTB in macrophages
  - 1513 A→C SNP reduces P2X7 function

http://www.genecards.org/pics/loc/IL18-gene.png
WAYS TO COUNTER TB HEALTH DISPARITIES

1. Facilitate patient awareness and education for prevention, diagnosis, and treatment of tuberculosis
2. Create or modify local, low-cost TB screening programs in at-risk cities
3. Improve screening processes during immigration
4. Embrace diverse cultures and provide support services
CONCLUSION

• Highest number of TB cases in MA found in Asians (44%)
• Boston has about 5 times as many cases as other major cities
• Foreign-born cases make up 80-90% of all TB cases in Boston
• Immigration plays an important role in TB disparity
• Potential genetic factors affect TB susceptibility in Asians
• Plan to reduce TB Health Disparities


REFERENCES


ANY QUESTIONS?