Characteristics of INH-monoresistant Tuberculosis in Florida, United States, 1993-2008

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Abstract:

**Background** Tuberculosis (TB) is a major global health problem and was the second leading cause of death from an infectious disease worldwide in 2012. Anti-TB drug resistance challenges effective TB treatment and control. Isoniazid (INH) is an important first-line anti-TB drug and widely used for treatment of latent TB infection and active TB. Resistant to INH may lead to worse outcomes. The characteristics of TB resistant to INH in Florida, United States, have not been well described.

**Objectives** Evaluate the demographic and clinical characteristics of INH-monoresistant TB patients and identify potential risk factors associated with INH monoresistance.

**Methods** We conducted a retrospective cohort study on all the cases of culture-confirmed INH-monoresistant pulmonary TB in Florida reported to the Tuberculosis Information Management System (TIMS) at CDC from 1993 and 2008. These cases were compared with drug-susceptible TB cases and multi-drug resistant TB (MDR-TB) cases.

**Results** The proportion of INH-monoresistant TB cases slightly increased from 1993 (6.04%) to 2008 (6.73%), with the highest number 10.07% in 2001, while the proportion for MDR-TB decreased from 1993 (2.40%) to 2008 (0.53%). Significant differences (P<.05) among the three groups were found in age, race, country of origin, history of TB, HIV status, homeless, resident of correctional facility, inject and non-inject drug use within the past year, and excess alcohol use within the past year. Compared to drug susceptible TB cases, Age 25-44 (OR, 1.43; 95% CI, 1.11-1.84) and 25-64 (OR, 1.7; 95% CI, 1.33-2.17), Asian/Pacific islander (OR, 1.85; 95% CI, 1.3-2.62) and Black (OR, 1.2; 95% CI, 1-1.45), foreign born (OR, 1.58; 95% CI, 1.35-1.84), and residence of correctional facility (OR, 1.62; 95% CI, 1.23-2.14), positive HIV (OR, 1.2; 95% CI, 1-1.43), non-injecting drug use (OR, 1.26; 95% CI, 1.03-1.55) were significantly associated with INH monoresistance, while previous history of TB were not significantly associated with INH-monoresistant TB.

**Conclusions** INH-monoresistant TB cases did not decline and even slightly increased from 1993 to 2008. INH-monoresistant TB had different demographic characteristics compared to drug susceptible and MDR-TB cases. However, no significant differences among the three groups were found in clinical characteristic. Age 25-64, Asian/Pacific islander and Black, foreign born, residence of correctional facility, HIV infection and non-injecting drug use were the risk factors associated with INH-monoresistance. More efforts are needed to prevent INH resistant TB in Florida, especially in those specific population. Unexpectedly, previous history was not significantly associated with INH-monoresistance. Further studies are needed to verify this.
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MPH Competencies Strengthened

- Diagnosing and investigating health problems and health hazards in the community using an ecological framework
- Informing, educating, and empowering people about health issues
- Mobilizing community partnerships and action to identify and solve health problems
- Developing policies and plans that support individual and community health efforts
- Evaluating effectiveness, accessibility, and quality of personal and population-based health services
- Conducting research for new insights and innovative solutions to health problems

Biostatistics Concentration Competencies Strengthened

- Describe the role of biostatics in public health research
- Interpret and critique analyses found in public health studies
- Use appropriate statistic methodology to address public health problems
- Communicate effectively with investigators in other areas of public health
- Develop presentations based on statistical methods and analyses for both public health professionals and educated lay audiences
- Apply software to conduct statistical analyses

Public Health Relevance

The study was conducted in the population with the infectious disease-Tuberculosis (TB), which is a major global health problem that Public Health Concerns About. Through researches on this particular population, we hope to better understand the characteristics of TB patients in Florida. The study results exhibit potential to contribute to the TB control by utilizing the useful information to develop effective programs and guide the TB treatment.