Diagnostic Testing for *Mycobacterium tuberculosis* – an IDSA EIN Survey.

T.E. Herchline, S.D. Burdette, S.E. Beekmann, P.M. Polgreen
and the Infectious Diseases Society of America's Emerging Infections Network
Wright State Univ., Dayton, OH, Univ. of Iowa, Iowa City, IA

Abstract

Background: In 2001, the FDA approved the first interferon-gamma release assay (IGRA) for the diagnosis of latent and active tuberculosis. There are several nucleic acid amplification tests (NAATs) approved for use in the rapid identification of *M. tuberculosis* in respiratory samples. The purpose of this study was to determine: (1) availability of IGRA; (2) most common indications for ordering IGRA; (3) availability of NAATs for diagnosis of tuberculosis in various clinical scenarios; and (4) timeliness of TB susceptibility results.

Methods: The IDSA Emerging Infections Network (EIN) is a sentinel network of infectious disease consultants (IDCs). In January 2008, we distributed a survey via e-mail and facsimile to IDCs.

Results: There were 583 respondents (52% of 1122 members). Over half of respondents considered themselves the local tuberculosis expert. More than 85% of respondents from the West North Central and Pacific regions reported availability of QFT, while ≤45% of respondents from the West South Central, South Atlantic and East South Central regions reported availability. Most (31%) respondents used commercial or reference laboratories for IGRA; only 12 states had members who reported that IGRA was performed at a public health lab. NAATs for rapid identification of *M. tuberculosis* in respiratory samples was available for 66% of respondents in their local areas; only a quarter (22%) reported that local labs would perform these tests directly on smear-negative respiratory samples. Most (266 of 511 providing an answer) indicated that susceptibility testing is performed in a public health laboratory, and 57% of those said results took more than the recommended time (30 days) to return.

Conclusion: Significant geographic variability was observed in the availability and use of the interferon-gamma release assay (IGRA) for latent tuberculosis. There is limited availability of rapid NAATs among local laboratories. There are significant delays in receiving the results of susceptibility testing.

Methods

The IDSA EIN is a provider-based, emerging infections sentinel network that was established through a Cooperative Agreement Program Award from the Centers for Disease Control and Prevention (CDC) in 1995. It comprises volunteers who practice adult and pediatric infectious diseases medicine and belong to either the IDSA or the Pediatric Infectious Diseases Society. In January 2008, the EIN distributed a 1-page introduction and a 1-page questionnaire via e-mail or facsimile to its 1122 members, asking them about diagnostic testing for *Mycobacterium tuberculosis*. Nonresponders received a second and third survey 2 and 4 weeks, respectively, after the initial distribution. Denominators for some questions vary because EIN members did not respond to all questions.

Results

•Overall response rate:	583 of 1122 members (52.0%)
•Practice:	Adult 416 of 826 members (50%)
	Pediatrics 133 of 223 members (60%)
	Both 34 of 73 members (47%)

	All	Pediatric
•TB susceptibility testing is performed:	511	116
In-house/local academia	22%	29%
Public health lab	52%	38%
Commercial/reference lab	26%	33%
•Susceptibility results are available:	466	105
≤30 days [recommended]	48%	52%
>30 days	52%	48%
•Local labs area perform Nucleic Acid Assays:	519	119
For tuberculosis	66%	64%
Directly on smear-pos respiratory samples	60%	56%
Directly on smear-neg respiratory samples	22%	14%
Directly on non-respiratory samples	26%	20%
•Is QuantiFERON (QFT) available in your area?	514	117
Yes	63%	74%
No	37%	26%
•Where is QFT performed?	318	84
In-house/local academia	28%	24%
Public health lab	22%	26%
Commercial/reference lab	50%	50%
•Seen discordant results between TST & QFT?	288	74
No	58%	68%
Yes	42%	32%
•For discordant results, decisions based on:	120	23
TST	3%	3%
QFT	23%	14%
Depends on clinical situation	73%	83%
•Seen problems with indeterminate results?	268	63
No	77%	81%
Yes	23%	19%

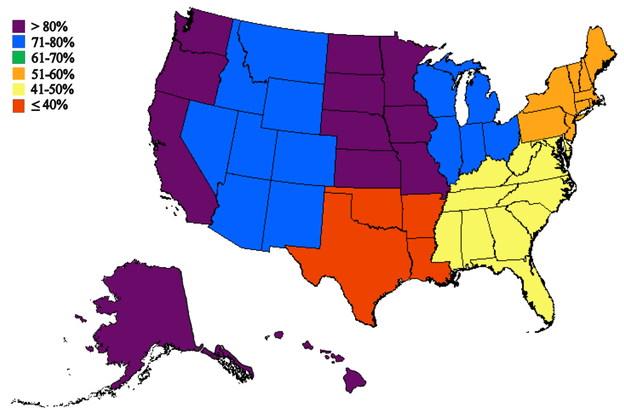

Figure. Respondents reporting availability of IGRA testing, by region

Table. Use of QFT by geographic region and type laboratory

	Ordered QFT (%)	Local	Pub Health	Commercial Lab
New England	15 (27%)	3	3	8
Mid Atlantic	24 (31%)	4	3	14
East North Central	39 (46%)	16	1	22
West North Central	18 (44%)	10	2	7
South Atlantic	21 (19%)	11	0	8
East South Central	9 (31%)	3	0	6
West South Central	11 (26%)	2	5	4
Mountain	17 (59%)	8	3	4
Pacific	56 (53%)	17	28	11
Puerto Rico	1 (25%)	0	0	1
Canada	0			

Summary

- Most of the responders considered themselves the local tuberculosis expert
- Susceptibility testing is most commonly available through public health laboratories
- Susceptibility testing results are often delayed (more than the recommended 30 days)
- Significant geographic variability was observed for the availability of interferon-gamma release assays (IGRA) for latent tuberculosis
- Responders order IGRA in a variety of clinical settings - the most common situations are previous BCG vaccination, suspicion of active tuberculosis or health care employee
- Indeterminate results were reported as a problem by nearly one quarter of responders
- Nucleic acid amplification testing for tuberculosis is not widely available

References

1. Mazurek GH, Jereb J, LoBue P, Iademarco MF, Metchock B, Vernon A. Guidelines for using the QuantiFERON-TB Gold test for detecting *Mycobacterium tuberculosis* infection, United States. MMWR December 16, 2006; 54 (RR-15):49-55.
2. Menzies D, Pai M, Comstock G. Meta-analysis: New tests for the diagnosis of latent tuberculosis infection: areas of uncertainty and recommendations for research. Ann Intern Med 2007;146:340-354.
3. Pfyffer, GE, Kissling, P, Jahn, EM, et al. Diagnostic performance of amplified *Mycobacterium tuberculosis* direct test with cerebrospinal fluid, other non-respiratory, and respiratory specimens. J Clin Microbiol 1996; 34:834-841.
4. Bradley, SP, Reed, SL, Catanzaro, A. Clinical efficacy of the amplified Mycobacterium tuberculosis direct test for the diagnosis of pulmonary tuberculosis. Am J Respir Crit Care Med 1996; 153:1606-1610.
5. Executive Committee of the Infectious Diseases Society of America Emerging Infections Network. The Emerging Infections Network: a new venture for the Infectious Diseases Society of America. *Clin Infect Dis* 1997; 25:34-36.
6. US Census Bureau. Maps in American factfinder. 22 August **2004**. Available at: http://factfinder.census.gov/jsp/saff/SAFFInfo.jsp?_pageIdpgn7_maps&_submenuIdpmaps_0. Accessed __.

Correspondence: therchline@gmail.com