Yakima Health District BULLETIN

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Community-Based TB Control through Treatment of Latent Infection

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Overview

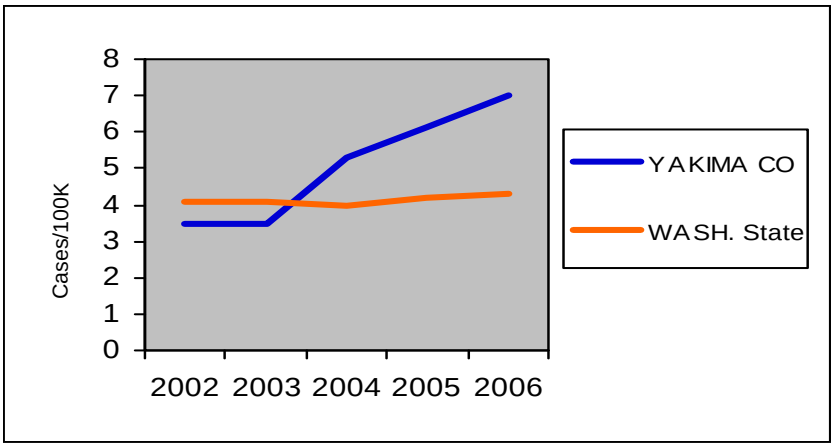
Tuberculosis continues to be a preventable cause of morbidity in Yakima County, with local incidence surpassing that for Washington State over the past several years (Figure). The absolute figures do not adequately describe the impact of TB in Yakima County because they do not capture the resources required to manage active patients through their full course of therapy, conduct thorough contact investigations, and ensure completion of therapy by infected contacts. YHD leads TB control efforts by carrying out directly observed therapy and case management for active cases, conducting contact investigations to identify and treat recently infected individuals, and dedicating focused resources to identify other cases of latent TB in other high risk populations and refer them to local primary care systems for treatment. While these activities are geared toward preventing TB from increasing further, they are insufficient to achieve reductions in TB incidence. Shrinking the pool of untreated latent infections from which the flow of active cases emerge is a necessary intervention that requires the support and participation of primary care providers in our community.

The basic formula for identifying and treating latent TB infection (LTBI) is as follows: (1) identify patients with risk factors, (2) screen for infection with a tuberculin skin test (PPD) or interferon-gamma release assay, (3) exclude active TB via a clinical evaluation and chest radiography for those with positive test results, as well as for those with symptoms suggestive of TB, and (4) ensure completion of treatment for those demonstrated to have LTBI.

Quantiferon Gold

Targeting resources toward populations and patients most likely to have LTBI, as well as those most likely to reactivate if infected, is essential to making these efforts efficient and sustainable. Interferon gamma release assays (IGRAs) are a tool which can be used to increase the certainty with which we devote resources to treat a patient thought to have LTBI. Quantiferon-Gold (QF-G) is the only IGRA approved for use in the United States. QF-G is a whole-blood based assay that detects interferon gamma released by lymphoctyes in response to incubation with two synthetic polypeptides that mimic proteins specific to *M. tuberculosis* complex. These polypeptides (CFP-10 and ESAT-6) are virtually unique to TB; they are not present in BCG nor in the vast majority of environmental mycobacteria, the major biologic causes of false positive PPDs. In addition to CFP-10 and ESAT-6 stimulation, QF-G specimens are also incubated with a positive control (containing a non-specific mitogen) and a negative control. The positive control mitogen result provides a measure of whether a person can adequately respond in the assay. This is particularly useful in immunocompromised patients or those receiving immunosuppressive therapy. Although there is no gold standard for LTBI diagnosis,

TB Rates, Yakima County and Washington State, 2002-06



QF-G's sensitivity in cases of active disease is similar to that for PPD skin-testing (70-80%) and its specificity is superior (99%). In BCG-vaccinated populations, up to one-half of patients with PPDs of 10-15mm have negative QF-G results, emphasizing its presumed superior specificity in this group.9 QF-G is FDA approved as a screening test for LTBI. In terms of performance, QF-G is a reasonable (or even preferred) alternative to PPD for patients at risk for LTBI, particularly those with a history of BCG-vaccination. Because only one clinical interaction is necessary for patients with negative results, QF-G also carries logistic advantages for use in populations or facilities conducting serial testing.

However, there are limitations to the use of QF-G, as well. First, negative QF-G results must be interpreted with caution in patients with altered cellular immunity (e.g., HIV infection, congenital immunodeficiency, medical immunsuppression, overwhelming TB disease). Furthermore, observations of more frequent discrepancies between PPD and QF-G results in children (vs. adults) has led to caution about its sensitivity and use as a screening test for LTBI in children. Probably the single greatest barrier to more widespread implementation of QF-G has been the requirement that whole blood specimens be processed by the laboratory within 12 hours of collection. However, a new 'In-Tube' QF-G format recently has been approved by the Food and Drug Administration. This edition mitigates the 12-hour specimen processing requirement by allowing the incubation step of the test to occur in the tube where the blood is collected by holding it overnight at 37C. Samples can then be centrifuged, stored at 2-8C, and forwarded to a testing facility in periodic shipments (e.g., weekly). Cost is also a factor, with charges ranging from $33-150 per specimen, depending on the facility and arrangement for payment.

YHD does not conduct, provide or pay for QF-G testing. Locally, QF-G is only available through the Tri-Cities Laboratory in Kennewick (http://www.tricitieslab.com/; [509] 736-0105). Other sites providing QF-G testing in Washington State are Spokane Regional Health District (509-324-1600) and Providence St. Peter's Medical Center in Olympia (888-492-9480). YHD's hope is that the in-tube version will lead more laboratories and clinicians to provide the test.

Clinical Recommendations for Completing LTBI Evaluation

Please remember that, regardless of the method used, testing for LTBI should be focused on populations with epidemiologic risk for TB (e.g., recent contacts to active pulmonary TB and people born in or having extended travel to Africa, Asia, Latin America, or eastern Europe). Also targeted for testing are individual patients with factors that predict a high risk for reactivation if infected (e.g., HIV infection, fibrotic lesions on chest radigographs, diabetes mellitus, medical immunosuppression [especially TNF-alpha blockers]; pulmonary, head/neck, or hematologic malignancies; chronic renal failure; gastric/jejunoileal bypass). Detection of LTBI in the absence of therapy is of no substantial personal or public health benefit. Therefore, YHD strongly encourages providers to follow-up and treat the latent TB infections they detect.

Prior to launching therapy for LTBI, *active* TB should be excluded by chest radiography and clinical evaluation and the patient should be in his/her baseline health. Please note that, for patients with fibrotic lesions suggestive of old TB, a complete evaluation includes collection of sputa for AFB smear and culture, followed by a stable chest radiograph.

Treatment of LTBI

The preferred regimen for treatment of latent TB remains isoniazid given daily for 9 months (adults 5mg/kg/d, children 10-20 mg/kg/d; 300mg/d maximum). Pyridoxine supplementation (e.g., 25-50 mg daily) is recommended for paitents with risk factors for peripheral neuropathy (e.g., diabetes mellitus, HIV infection, renal disease, frequent alcohol use, low body weight, malabsorption), as well as for those who develop parasthesiae while on therapy. Rifampin given daily for four months (adults 10mg/kg/d, children 10-20mg/kg/d; 600mg/d maximum) is an alternative for patients in whom isoniazid is contraindicated or not tolerated. The formerly recommended regimen of rifampin-plus-pyrazinamide should not be used due to unacceptably high incidence of hepatotoxicity.

Monthly clinical monitoring for adherence and tolerance is recommended for all patients taking isoniazid or rifampin for LTBI. This should be supplemented with instructions to interrupt therapy and seek further evaluation if adverse effects occur between monthly evaluations, particularly if nausea, anorexia, excessive fatigue, rash, or easy bruising/bleeding occurs. Hepatic profile testing can be reserved for patients with risk factors for liver injury (e.g., frequent alcohol use, history of chronic hepatitis B or C infection, HIV, use of other potentially hepatotoxic medications, pregnant and post-partum women), as well as for patients with symptoms suggestive of liver injury.

For more information on diagnosis and treatment of LTBI, including use of QF-G, please visit http://www.cdc.gov/tb/ . The Centers for Disease Control and Prevention's key summary guidelines can be downloaded from the YHD website, as well http://www.co.yakima.wa.us/health/providersonly/bulletin.htm .

West Nile Virus Found in Local Horses

From August 17 through September 21, mosquito-borne West Nile Virus (WNV) was detected in eight horses in White Swan (3), Harrah (2), Brownstown (1), and Wapato (2). Two of the horses died and the remainder appeared to be recovering at last notice. One bird has tested positive in Yakima County. Despite the evidence of equine and avian WNV, no human cases have been reported in the area. Human cases have been reported this year in Idaho (109), Oregon (25) and British Columbia (18), but to a lesser extent than last year (almost 1000 were reported in Idaho in 2006).

WNV disease occurs in about 20% of infected humans and is characterized by a systemic febrile illness often accompanied by lymphadenopathy and rash. Neuroinvasive

disease occurs in about 1% of cases and is characterized by meningitis, encephalitis, and/or extrapyramidal symptoms. Treatment is supportive and prevention focuses on avoiding mosquitos and eliminating or applying larvicides to breeding habitats (i.e., standing water). With the seasons now definitively turning and overnight freezes having arrived, it would appear that the State of Washington passed yet another year without significant human morbidity (zero cases this year). No single unifying explanation exists for why Washington remains spared relative to our neighbors.

For more information:
http://www.doh.wa.gov/ehp/ts/Zoo/WNV/WNV.html
http://www.cdc.gov/ncidod/dvbid/westnile/

Pertussis Contacts, Tdap Boosters, and Chemoprophylaxis Revisited

In 2006, 21 confirmed and probable cases of pertussis were reported in Yakima County, down from 188 in 2005 (Figure—line graph, Reported Pertussis Cases, Yakima County, 1996-2006). To date in 2007, 20 cases have been reported. This recent decline is consistent with the cyclic nature of pertussis outbreaks, which tend to occur every 2-5 years. Long term prevention of pertussis in the community depends not only upon ensuring immunization of infants and young children, but also upon boosting immunity among adolescents and adults. The latter can now be achieved through routine use of Tdap boosters (acellular pertussis vaccine along with tetanus-diptheria).[1] Tdap formulations should largely replace the use of Td for tetanus boosting among adolescents and adults. Unfortunately, vaccine suppliers report that the majority of tetanus booster orders continue to request Td instead of the recommended Tdap. Please incorporate this vaccine into your practice. For assistance or advice in this matter, please contact YHD's immunization consultant at (509) 249-6541.

Each reported pertussis case leads to an investigation by a YHD communicable disease nurse who consults on patient management issues, collects epidemiologic information about the case, identifies secondary cases, and ensures provision of chemoprophylaxis to at-risk contacts. Recent reports of outbreaks of false positive PCR results for pertussis have heightened inquiries, or even skepticism, about who is considered a candidate for chemoprophylaxis.[2] Notwithstanding these concerns, chemoprophylaxis of pertussis contacts is based upon evidence that its use in appropriate circumstances can protect individuals and potentially interrupt transmission.[3] The decision to administer post exposure chemoprophylaxis is made after considering the infectiousness of the patient and the intensity of the exposure, the potential consequences of severe pertussis in the contact, and possibilities for secondary exposure of persons at high risk from the contact (e.g., infants aged <12 months).

Consistent with current Centers for Disease Control and Prevention recommendations, the criteria YHD uses for recommending or providing chemoprophylaxis to contacts include:

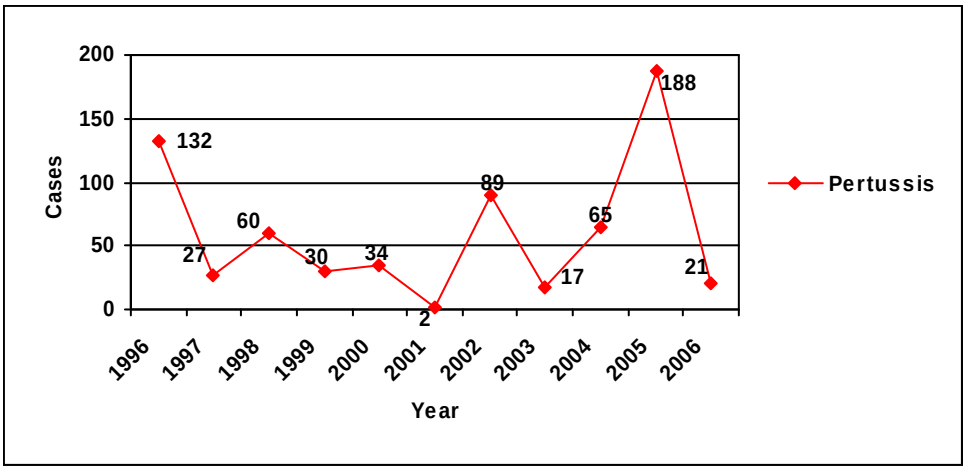
- Household members
- Health care providers conducting examinations or cough-inducing procedures in the absence of respiratory droplet protection (i.e., mask)
- Exposure for >1 hour in a confined space (e.g., sleepovers, birthday parties, some clubs or sports teams)
- Other close exposure with vulnerable individuals (e.g., children <12 months, women in third trimester of pregnancy, immunocompromised, chronic respiratory disease)

Adequate regimens for pertussis chemoprophylaxis remain macrolides, with trimethroprin/sulfamethoxazole serving as an alternative for those with contraindications or intolerance to macrolides. Detailed regimens can be found at

http://www.co.yakima.wa.us/health/documents/pertussischart.gif

To report a suspected or confirmed case or obtain consultation regarding pertussis, please call YHD at 509-249-6541.

Yakima County Pertussis Cases 1996-2006



[1]Advisory Committee on Immunization Practices. Preventing Tetanus, Diphtheria, and Pertussis Among Adults: Use of Tetanus Toxoid, Reduced Diphtheria Toxoid and Acellula Pertussis Vaccine. MMWR 2006;55(RR-17). http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5517a1.htm

[2]CDC. Outbreaks of Respiratory Illness Mistakenly Attributed to Pertussis --- New Hampshire, Massachusetts, and Tennessee, 2004—2006. MMWR 2007;56 (33):837-842. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5633a1.htm

[3]CDC. Recommended Antimicrobial Agents for the Treatment and Postexposure Prophylaxis of Pertussis. MMWR 2005;54(RR-14). http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5414a1.htm

YAKIMA HEALTH DISTRICT

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ATTENTION! NEW ADDRESS!

Reporting Line: (509) 249-6541
After hours Emergency: (509) 575-4040 #1
Toll Free: (800) 535-5016 x 541

Confidential Fax: (509) 249-6628

http://www.yakimapublichealth.org

	Cases			Total Cases by Year	
Condition *(includes confirmed and probable cases)*	**Jan-Sept**	**Jan-Sept**	**Jan-Sept**	**Total Cases by Year**	**Total Cases by Year**
	2007	**2006**	**2005**	**2006**	**2005**
Campylobacteriosis	97	159	89	202	114
Cryptosporidiosis	13	5	7	7	7
Enterohemorrhagic E. coli	5	4	3	5	3
Giardiasis	32	20	18	31	28
Salmonellosis	23	25	49	34	52
Shigellosis	13	22	19	32	29
Hepatitis A acute	0	1	2	1	3
Hepatitis B acute	0	5	1	5	1
Hepatitis B chronic	8	8	11	11	14
Hepatitis C acute	1	1	2	1	2
Hepatitis C chronic	171	133	161	176	214
Meningococcal	1	1	0	1	2
Pertussis	16	18	146	21	188
Tuberculosis	10	10	11	16	14
HIV New	8	7	9	10	14
HIV Deaths	0	0	1	1	2
HIV Cumulative Living	151	142	134	137	138
Chlamydia	906	824	709	1120	973
Genital Herpes—Initial	35	53	70	70	99
Gonorrhea	90	123	99	166	138
Primary and Secondary Syphilis	0	3	0	3	2

Notifiable Conditions Summary Jan– Sept, 2007