

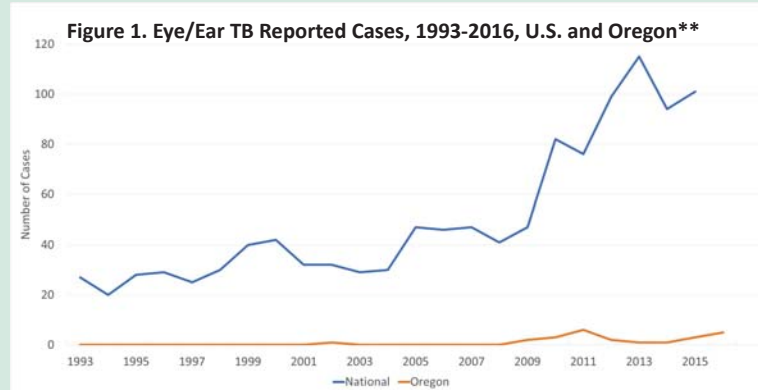
Keeping an Eye on Ocular TB: A Five-Year Review of Rates and Cases in Oregon

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Background

- Confirmed reports of ocular tuberculosis (TB)* have been increasing in the U.S. since 1993, with a more rapid increase since 2009 (Figure 1). The increase is seen in all age groups, all racial & ethnic groups, and in both U.S.-born and foreign-born populations. The true incidence of ocular TB is uncertain, but is estimated at less than 1% of all reported TB disease.**
- Ocular TB is challenging to diagnose. The presentation of disease is not specific and can affect any part of the eye. Definitive diagnosis requires isolation of *Mycobacterium tuberculosis* from ocular samples through aqueous paracentesis, vitreous biopsy, or retina biopsy, all of which can threaten sight. Also, these tests have low sensitivity due to low bacterial load in ocular specimens. Diagnosis of most cases of ocular TB is 'presumed' by suggestive ocular findings and a positive tuberculin skin test or interferon gamma release assay (IGRA). Clinical improvement subsequent to tuberculosis treatment supports a presumed diagnosis of ocular TB.

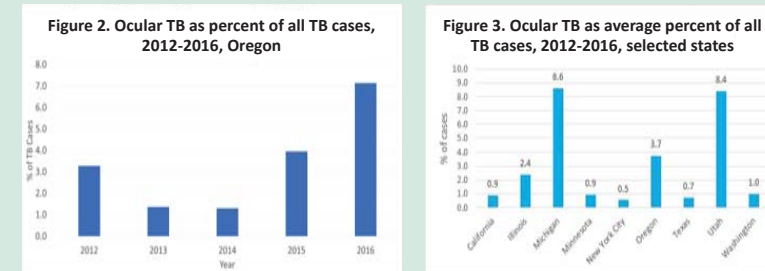


*Classified by the CDC as TB disease occurring in PHIN Anatomic Site 91, "Eye and Ear Appendages"
**Personal communication, CDC Division of Tuberculosis Elimination

Methods

The number of ocular TB cases in Oregon was compared to other states and large metropolitan areas using data obtained by survey of a convenience sample of states. A five-year retrospective chart review of Oregon ocular TB cases diagnosed between 2012-2016 was undertaken to determine risk factors, ophthalmic manifestations, IGRA and TB skin test (TST) results, and clinical outcomes.

Key Findings



- In Oregon, twelve verified cases of ocular TB were reported between 2012 and 2016, for an average of 3.7% of all confirmed TB disease cases.*** Ocular TB accounted for 12.5% of all extra-pulmonary cases during this time. The Oregon rate has been above the estimated national average since 2009, coincident with the widespread availability of the QuantiFERON interferon gamma release assay (Figure 2). Overall TB incidence in Oregon is consistently below the national average.
- Eight states responded to our request for ocular TB data for the five-year period. The rate of ocular TB in Michigan and Utah exceeded that of Oregon, but California, Illinois, Minnesota, New York City, Texas, and Washington all reported rates closer to the estimated national average (Figure 3).

***The 5-year average rose to 4.6% in 2017.

Case Review

- Among states with a higher than average ocular TB rate, the rate has been rising for the past five years.
- Of the 12 ocular cases reported between 2012-2016, 92% met CDC's clinical TB case definition as defined in the RVCT Manual. In eleven cases, ocular symptoms were the only clinical manifestation of TB disease. One case had concurrent pulmonary and ocular TB verified by a positive sputum culture and nucleic acid amplification test.
- All cases had one or more risk factors; 50% were foreign born. Risk factors, age, and sex distribution were not significantly different among ocular cases compared to all reported TB cases.
- All cases had a positive IGRA (QuantiFERON) test.
- Case presentations were varied. Half of the cases had bilateral disease. Five cases presented with panuveitis and three presented with posterior uveitis. There was one case each of chronic anterior uveitis, intermediate uveitis, optic neuritis and scleritis.



Figure 4. Large serous choroidal detachments with macular edema in right eye



Figure 5. Resolution of choroidal detachments after tuberculosis treatment



Figure 6. Complete resolution of choroidal detachments after tuberculosis treatment

Case Review, con't

- All cases improved with treatment (Figures 4-6). Length of treatment ranged from 11 weeks to 88 weeks. Fifty-eight percent completed treatment by directly observed therapy (DOT) or a combination of DOT and self-administered therapy.

Recommendations

- Patients with uveitis of unknown etiology or those showing lack of response to conventional therapy should always be screened for tuberculosis.
- Specific strategies for diagnosis and management of ocular tuberculosis should vary according to the background prevalence of TB in the region as well as the patient's individual risk factors for TB.
- To better understand the incidence of ocular TB in the U.S., an expert panel should be assembled to review all cases of reported ocular TB.