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Session: 153. Mycobacteria
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Background. Infections caused by the multi-drug-resistant *Mycobacterium abscessus* complex (MabsC) are challenging to treat and often require multiple antimicrobials for a prolonged treatment course and still have poor outcomes. Clofazimine, an oral anti-leprosy drug, has demonstrated good *in vitro* susceptibility and is being increasingly employed in treatment regimens for MabsC infections. We performed a drug-use-evaluation of clofazimine in the treatment of MabsC infections.

Methods. A retrospective review was performed for all patients with MabsC infections treated with clofazimine-containing regimens from January 2014 to June 2017.

Results. Twenty-nine patients were included. Twelve patients had pulmonary MabsC infections and seventeen had extrapulmonary infections. All isolates had clofazimine minimum-inhibitory-concentration of ≤ 0.5 mg/L as tested by broth microdilution. Clofazimine was prescribed at initiation of therapy in 31.0% (9/29), as a companion drug during maintenance therapy after initial intravenous therapy in 44.8% (13/29) and as part of salvage therapy due to disease progression or drug intolerance in 24.1% (7/29) of patients. Dosing of clofazimine for the pediatric patients was prescribed at 1–2 mg/kg/day while the adult patients received a range of 50–200 mg/day. Clofazimine was given for a median duration of 148.5 days (range: 14–1212) and most commonly in combination with clarithromycin (82.8%), amikacin (58.6%), and cefoxitin (24.1%). Twelve patients had documented adverse reactions attributable to clofazimine: skin hyperpigmentation (66.7%), abnormal liver function tests (16.7%), and gastrointestinal disturbance (16.7%). Table 1 describes the patients who had clofazimine ceased due to an adverse effect. Nine patients with pulmonary MabsC infections and 16 with extrapulmonary MabsC infections had documented improvement in symptoms.

Conclusion. Clofazimine as a companion drug in the treatment of MabsC infections was reasonably tolerated over a prolonged period of time. Its availability as an oral active agent makes it an attractive alternative to IV companion drugs and potentially improves compliance to the protracted treatment courses for patients with MabsC infections.

Table 1. Adverse effects reported with clofazimine use

Adverse effect	No. of patients (%) (n = 12)	No. of patients which had clofazimine discontinued	Median days of clofazimine received prior to cessation (range)
Skin hyperpigmentation	8 (66.7)	3	84 (67 - 212)
Transaminitis	2 (16.7)	2	112.5 (14 - 211)
Gastrointestinal disturbance	2 (16.7)	1	15

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1351. How Do Infectious Diseases Clinicians Manage Patients with Suspected Ocular Tuberculosis? Results of an Emerging Infections Network Survey

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Background. Ocular tuberculosis (OTb) is uncommon and many ID physicians (IDPs) have limited experience with OT. Ophthalmologists now include IGRAs in evaluating idiopathic uveitis, and some IDPs report increased referrals for possible OTb. Our goal was to understand how IDPs approach diagnosis, treatment, and reporting of OTb.

Methods. The Emerging Infections Network surveyed members treating adult ID patients in 2019 about referrals for suspected OTb. The survey used hypothetical case scenarios to evaluate factors influencing the management of possible OTb, and queried involvement of public health agencies.

Results. 754 of 1,379 (55%) physicians responded. 141 (19%) reported ≥ 1 referral for possible OTb in the past 3 years; 35% of these reported increasing referrals over time. Most frequent indications for referral were uveitis and positive IGRA (60%) and idiopathic uveitis without positive IGRA or TST (33%). For a hypothetical case with uveitis, positive IGRA but no other symptoms, respondents were much more likely (79% vs. 29%) to treat as TB disease if TB risk factors were present. Respondents were more likely to require a positive eye culture or NAAT prior to treating a risk factor-negative patient (39% vs. 12%). 54% of respondents believed $<10\%$ of eye specimens were culture or NAAT-positive for suspected OTb. 94% would treat suspected OTb with INH, RIF, PZA \pm EMB but duration of treatment varied with 27% stopping therapy for lack of clinical response and 59% continuing for at least 6 months regardless of response. 44% were unsure if improvement should be expected on therapy. One-third of respondents either did not report or reported only culture-confirmed OTb cases to treatment to public health agencies.

Conclusion. IDPs report increased referrals for possible OTb, mainly for idiopathic uveitis and positive IGRAs. There is considerable practice variation in

management of possible OTb. The decision to treat as TB disease is heavily influenced by TB epidemiologic risk factors, and there is heterogeneity in treatment duration and in expectation of response to therapy. Prospective studies to assess treatment responses in OTb and improved collaboration with ophthalmologists are necessary to better manage this emerging syndrome. Treated OTb cases should be reported to public health agencies.

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1352. The Burden of Active Tuberculosis in an Integrated Healthcare System, 1997–2016: Incidence, Mortality, and Excess Healthcare Utilization

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Background. Active tuberculosis (TB) often results from reactivation of latent tuberculosis infection (LTBI). This can be prevented through LTBI screening and treatment, yet only 12% of Californians have undergone LTBI therapy. Updated estimates on the complete burden of active TB are needed to rationally allocate resources for LTBI program implementation.

Methods. We identified all patients with microbiologically confirmed active TB in a large, integrated health system (Kaiser Permanente Northern California, or KPNC) from 1997 to 2016. We calculated active TB incidence in KPNC and measured this against California's reported cases. Within KPNC, we compared mortality, hospital, emergency department, and ambulatory care use among persons with active TB to age-, sex-, and year-of-diagnosis-matched cohort of persons without active TB.

Results. Active TB incidence was lower in KPNC (3.4/100,000 person-years) than in California (7.2/100,000 person-years). Among 2,522 active TB cases, early and delayed mortality was high with 7.0% dying within 1 year of diagnosis and 6.2% dying 1–5 years post-diagnosis. Of the 1,957 active TB patients who continued to receive care through KPNC for at least one year post-diagnosis, 603 (30.8%) had at least one hospitalization. In KPNC, active TB patients had higher healthcare utilization than the matched cohort in the one year following diagnosis: 0.6 vs. 0.1 hospitalizations, 9.5 vs. 4.6 days mean length-of-stay, 0.8 vs. 0.3 emergency department visits, and 14.6 vs. 5.9 ambulatory visits.

Conclusion. Patients with active TB disease have substantial mortality and high inpatient and outpatient healthcare utilization. By improving LTBI screening and treatment, large healthcare systems may be able to reduce the burden and costs associated with active TB.

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1353. Effect of Implementing Xpert MTB/RIF Ultra Assay on Diagnosis of Tuberculosis in a Medical Center in Central Israel

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Background. Tuberculosis (TB) is a worldwide public health concern both in developing and developed countries. The new Xpert MTB/RIF Ultra assay (Ultra, Cepheid, Sunnyvale, USA) recently endorsed by the WHO has high sensitivity to TB detection. The aim of this study was to assess the impact of this assay on TB diagnosis in a medical center in Israel where the baseline prevalence of TB is low.

Methods. The Xpert MTB/RIF Ultra assay is a cartridge-based automated diagnostic test that can simultaneously identify *Mycobacterium tuberculosis* complex and resistance to Rifampicin. We began using this test in 1.1.2018. To assess the impact of this assay on the rate of TB diagnosis we compared TB tests and positive cases during two time periods: period I (1.1.2017–31.10.2017) when TB diagnosis was based on the Xpert MTB/RIF assay to period II (1.1.2018 to 31.10.2018) when TB diagnosis was based on Xpert MTB/RIF Ultra assay. Included were all TB tests performed on sputum, deep suction or bronchoalveolar lavage. Files of positive patients were reviewed.

Results. The study included 1034 samples from 717 patients. Results are presented in Table 1. During the second period, TB rates increased by 231%. During the entire study there was no change in the hospital's guidelines regarding TB diagnosis policy and there was no epidemiological change in the population served by the hospital. Only three cases had rifampicin resistance. In 5 cases (20%) during period II the result was trace amounts, an entity that did not exist in the former assay and in 3 cases culture results were negative. In 2017, 6 patients (60%) were African born, 3 patients (30%) originated from Eastern Europe, and one patient (10%) was born in the Middle East region. In 2018, 9 patients (36%) were born in Africa, 9 patients (36%) were born in Eastern Europe, and 7 patients (28%) were born in the Middle East region. Mean age at diagnosis was 38 years for patients diagnosed during period I and 53 years for patients diagnosed during period II.

Conclusion. The new assay enabled a significantly higher diagnosis rate for TB at our institution. We believe that this mainly reflects a higher diagnosis rate in patients with paucibacillary TB. Further study is needed to assess the relation between cultured confirmed diseases and the assay results, particularly in patients with trace results.

Table 1. Results of TB testing.

Period	Test used	Number of samples	Number of patients	Number of positive patients	% positive samples	% positive patients
1.1.2017 to 31.10.2017	Xpert MTB/RIF	461	344	10	2.17	2.91
1.1.2018 to 31.10.2018	Xpert MTB/RIF Ultra	571	372	25	4.38	6.72

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1354. *Nocardia beijingensis*: A Novel Isolate Affecting Immunocompromised Patients in the United States

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Background. *Nocardia* species can cause localized or disseminated disease in humans. Infection results from direct inoculation or inhalation. In recent years, several new species have been identified via molecular methods. Further speciation is crucial as each organism has its own spectrum of disease and unique antibiotic susceptibility patterns. Immunosuppression, alcoholism, and certain lung diseases are well-established risk factors for nocardiosis. In fact, cases have incremented in association with increasing population of immunocompromised hosts as well as improved methods for detection and identification. Thus, *Nocardia* species may be considered opportunistic pathogens.

Nocardia beijingensis was first isolated in 2001 by Wang et al from sewage soil in China. The first human infections were reported in Asia. Subsequently, cases were reported in Europe and a few cases have been described in the United States but it has been infrequently cited in the literature. Thus, not much is known about its spectrum of disease.

Methods. The primary objective of this study was to determine the risk factors and clinical manifestations of *Nocardia beijingensis* infection via retrospective chart review of 6 cases identified in Tampa General Hospital and Moffitt Cancer Center within a 5-year period. We aimed to evaluate the treatment used and the antibiotic susceptibility patterns of the isolates.

Results. All patients were immunocompromised (1/3 HIV/AIDS, 1/3 hematologic malignancy, 1/3 solid-organ transplant). Most were male (67%) and mean age of 48. The majority had lung involvement (67%). Thecal sac infection and femur osteomyelitis (OM) were atypical manifestations. Localized disease predominated. Combination therapy was preferred. Trimethoprim-sulfamethoxazole (TMP-SMX), Ceftriaxone, and carbapenems were mostly used. All isolates were susceptible to TMP-SMX. See Table 1.

Conclusion. This case series depicts clinical features, risk factors, and epidemiology of *Nocardia beijingensis* infections. Our observations suggest that it is a novel pathogen in the United States, affecting mainly immunocompromised hosts. Early detection, appropriate antibiotics, and surgery were keys in successful management. However, further studies are needed to further elucidate its pathogenesis.

Table 1. Case Description

Case Number	1	2	3	4	5	6
Age	32	41	50	34	59	72
Gender	F	F	M	M	M	M
Risk Factors	HIV/AIDS, alcohol abuse	Kidney transplant (KT), steroids, uncontrolled diabetes, immunosuppressant (IS)	Multiple myeloma, chemotherapy, steroids, yardwork	HIV/AIDS, homeless, concomitant mycobacteria lung infection	Acute myelogenous leukemia, stem cell transplant, steroids, IS, prior nocardiosis	KT, IS, steroids, concomitant zygomyces
Symptoms	confusion, lumbar pain, lower extremity weakness	left thigh abscess	fever, dry cough, severe headache	fever, productive cough, hemoptysis	asymptomatic	fever, dyspnea
Imaging	thecal sac infection, epidural abscesses (figure 1)	femur osteomyelitis (figure 2)	pulmonary nodules, multiple ring enhancing brain lesions	cavitary lung lesions	pulmonary nodules	cavitary pneumonia
Disease Extent	localized	localized	disseminated	localized	localized	localized
+ Culture	abscess	abscess	bronchial tissue	sputum	lung nodule	BAL
Antibiogram						
TMP-SMX	+ S	+ S	+ S	+ not done	+ S	+ S
Carbapenem	+ S	+ S	+ I	-	- S	- S
Ceftriaxone	+ TS	+ S	+ S	-	+ S	- S
Minocycline	- TS	- I	- I	-	+ I	- S
Linezolid	- S	- S	+ S	-	- S	- S
Amikacin	- S	- S	- S	-	- S	- S
Surgery	+	+	-	-	-	-



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1355. Efficacy and Tolerability of Linezolid Adjunctive Treatment for Nontuberculous Mycobacterial Infection in Patients with Acquired Anti-Interferon-Gamma Autoantibody

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Background. Despite a long duration of combined oral antimycobacterial drugs, relapse/ reinfection of nontuberculous mycobacteria (NTM) is common among patients with anti-interferon gamma autoantibodies (anti-IFN-γ auto-Abs).

Methods. We reported here, an interim analysis of the prospective study of 25 patients with anti-IFN-γ auto-Abs, who received oral linezolid (LZD) adjunctive treatment for their NTM infections, at Siriraj Hospital, Bangkok, Thailand, between December 2017 and April 2019.