(Figure 1). Branching times for L2 and L4 were smaller than L1 and L3 indicating recent introduction into the region ($p < 0.001$ [KS test]).

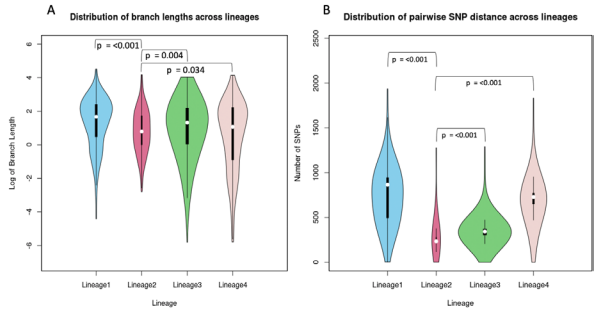



Figure 1: Lineage-wise distribution of A) phylogenetic tree branch lengths (log) and B) pairwise single nucleotide polymorphism (SNP) distance, using 612 tuberculosis isolates from Pune, India. P values calculated using two-sample Kolmogorov-Smirnov test.

| | Lineage 1 (n=162) | Lineage 2 (n=45) | Lineage 3 (n=273) | Lineage 4 (n=132) | Total (n=612) |
|---|---|---|---|---|---|
| Female Gender | 59 (36.4%) | 13 (28.9%) | 103 (37.7%) | 41 (31.1%) | 216 (35.3%) |
| Median Age (Range) | 32 (18-74) | 29 (18-57) | 31 (18-70) | 30 (18-65) | 31 (18-74) |
| Smear Positive | 138 (85.2%) | 40 (88.9%) | 222 (81.3%) | 110 (83.3%) | 510 (83.3%) |
| HIV Positive | 6 (3.7%) | 1 (2.2%) | 17 (6.2%) | 14 (10.6%) | 38 (6.2%) |
| Known Diabetes Mellitus | 21 (13%) | 3 (6.7%) | 38 (13.9%) | 18 (13.6%) | 80 (13.1%) |

Table 1: Demographic characteristics of study participants included in the study, by lineage.

***Conclusion.*** Modern *Mtb* lineages (L2 and L4) were relatively recently introduced in western India, as compared to older lineages (L1 and L3), with the more drug-resistant L2 showing higher transmissibility. These findings highlight the need for early detection and treatment initiation to interrupt transmission with important implications for antimicrobial stewardship and heightened surveillance of TB resistance rates.

***Disclosures.*** **All Authors**: No reported disclosures

**1398. Gland Tuberculosis: A Rare Localization of Tuberculosis**

Fatma Hammami, MD[1]; Makram Koubaa, MD[1]; Amal Chakroun, MD[1]; Khaoula Rekik, MD[1]; Chakib Marrakchi, MD[1]; Fatma Smaoui, MD[1]; Mounir Ben Jemaa, MD[1]; [1]Infectious Diseases Department, Hedi Chaker University Hospital, University of Sfax, Tunisia, Sfax, Sfax, Tunisia

**Session:** P-80. Tuberculosis and other Mycobacterial Infections

***Background.*** Tuberculosis (TB) is a multisystem disease that might affect all organs. Gland TB is characterized with a misleading clinical presentation which often mimic a neoplastic process. The aim of our work was to study the clinical, therapeutic and evolutionary features of gland TB.

***Methods.*** We conducted a retrospective study including all patients hospitalized for gland TB in the infectious disease department between 1999 and 2020.

***Results.*** We encountered 28 cases among which 24 were females (85.7%). The mean age was 39±14 years. A rural origin was noted in 15 cases (53.5%). Two patients were previously treated for TB (7.1%). Systemic symptoms of TB included fever (60.7%), asthenia (53.5%), loss of appetite (46.4%) and weight loss (25%). There were 18 cases of breast TB (64.3%), 4 cases of salivary gland TB (14.3%) and 3 cases of ovarian TB (10.7%). Two cases of pituitary TB (7.1%) and one case of adrenal TB (3.6%) were noted. Multifocal TB was noted in 7 cases (25%). Lymph node (17.8%), pulmonary (14.2%) and peritoneal (7.1%) TB were associated with gland TB. Tuberculin skin test was positive in 19 cases (67.8%). The diagnosis was based on histopathological proof in 23 cases (82.1%), microbiological proof in 4 cases (14.3%) and clinically confirmed in one case (3.6%). The median duration of antitubercular therapy was 10 [9-15] months. Patients received fixed-dose combination in 11 cases (39.2%). Adverse effects of antitubercular therapy were noted in 10 cases (35.7%) represented by gastrointestinal symptoms (14.3%), increase in hepatic enzyme levels (14.3%) and skin reactions (7.1%). The disease evolution was favorable in 26 cases (92.9%). Relapse was noted in two cases (7.1%).

***Conclusion.*** Gland TB included different sites. The presence of systemic symptoms of TB and the diagnosis of TB elsewhere in the body helped through the diagnosis process which requires high index of suspicion. It was mainly based on histological evidence.

***Disclosures.*** **All Authors**: No reported disclosures

**1399. Clarithromycin–Rifampin-based Treatment for Non-tuberculous Mycobacterial Infections in Immunocompromised Patients Who Require Concomitant CYP-Metabolized Medications**

Isabel H. Gonzalez-Bocco, MD[1]; Muneerah M. Aleissa, PharmD[1]; Matthew Cheng, MD[2]; Jennifer Manne-Goehler, MD, DSc[1]; Francisco M. Marty, MD[3]; [1]Brigham and Women's Hospital, Chestnut Hill, Massachusetts; [2]McGill University Health Centre, Montreal, Quebec, Canada; [3]Massachusetts General Hospital, Dana-Farber Cancer Institute, Harvard Medical School, Boston, Massachusetts

**Session:** P-80. Tuberculosis and other Mycobacterial Infections

***Background.*** Non-tuberculous mycobacteria (NTM) are causes of pulmonary and extrapulmonary disease that frequently affect immunocompromised hosts (ICH). Current treatment guidelines recommend a macrolide-based, multi-drug regimen that includes rifampin. Rifampin is a potent cytochrome P450 (CYP) 3A inducer, which often results in drug-drug interactions in ICH receiving multiple CYP substrates. One way to mitigate rifampin's CYP induction is to utilize clarithromycin, a CYP inhibitor, as the accompanying macrolide. We evaluated the incidence of NTM treatment-related adverse events (AEs) in patients who received a clarithromycin-based regimen compared to patients who received an azithromycin-based regimen.

***Methods.*** We conducted a retrospective review of NTM infection in 30 immunocompromised adults. All participants had a positive culture for a NTM and had received a rifamycin (rifampin or rifabutin) with a macrolide (azithromycin or clarithromycin) for treatment at Brigham and Women's Hospital between 01/01/2011-10/18/2020 or Dana-Farber Cancer Institute between 06/03/2015-07/01/2020. The primary outcome was the incidence of NTM treatment-related AEs in patients who received a clarithromycin-based regimen compared to those who received an azithromycin-based regimen.

***Results.*** There were no significant differences in the reasons for discontinuation of NTM treatment or 90-day mortality between groups. The number of AEs possibly related to NTM treatment were similar in patients who received a clarithromycin-based regimen and those who received an azithromycin-based one (10/13 vs. 14/17; p=0.73). The most common AE was liver function test abnormalities (Table 1). Additionally, the proportion of patients requiring dose adjustments for interacting medications and patients with out-of-range tacrolimus levels were similar between the two groups (23.1% vs. 29.4%; p=0.76 and 8.0% vs. 6.0%; p=1.00, respectively).

Table 1: Adverse events

| Adverse event | Clarithromycin-based regimen (n = 13) | | | | Azithromycin-based regimen (n = 17) | | | | | p-value |
|---|---|---|---|---|---|---|---|---|---|---|
| | Any Grade | Grade 1 | Grade 2 | Grade 3 | Any grade | Grade 1 | Grade 2 | Grade 3 | Grade 4 | |
| LFT abnormalities | 7 | 5 | 1 | 1 | 4 | 3 | 1 | - | - | 0.13 |
| QTc prolongation | 5 | 4 | 1 | - | 6 | 3 | 2 | 1 | - | 1 |
| Gastrointestinal (nausea, vomiting, diarrhea, constipation) | 3 | 2 | - | - | 7 | 4 | 1 | 2 | - | 0.13 |
| Worsening baseline condition | 2 | 1 | 1 | - | 8 | 4 | 4 | 1 | - | 0.11 |
| Visual alterations | 1 | - | 1 | - | 1 | - | - | - | 1 | 1 |
| Tinnitus | 0 | - | - | - | 2 | - | 2 | - | - | 0.49 |
| Hearing loss | 0 | | | | 4 | 4 | - | - | - | 0.11 |

***Conclusion.*** A clarithromycin-based regimen for NTM treatment was safe and well tolerated in our patient population. This combination provides a good alternative for patients requiring medications that are CYP substrates, or those who cannot tolerate azithromycin.

***Disclosures.*** **Matthew Cheng, MD**, **GEn1E Lifesciences** (Advisor or Review Panel member)**Kanvas Biosciences** (Board Member, Shareholder)**nplex biosciences** (Advisor or Review Panel member)

**1400. Pretomanid in the Treatment of Patients with Tuberculosis in the United States: the Bedaquiline, Pretomanid and Linezolid (BPaL) Accelerated Monitoring (BAM) Project**

Neela Goswami, MD, MPH[1]; Lakshmi Praveena Peddareddy, MD[1]; John Jereb, MD[1]; Angel Colon Semidey, MD[2]; Elaine Darnall, RN[3]; Patricia Macias, MD[4]; Supriya Jasuja, MD, MPH[4]; Karen Landers, MD[5]; Shom Dasgupta, MD[6]; Margaret Oxtoby, MD[7]; Christopher Spitters, MD, MPH[8]; Lana Dov, RN[9]; Masa Narita, MD[10]; Malini DaSilva, MD, MPH[11]; Tracina Cropper, PHA[1]; Cricket Gullickson, BS[1]; David Ashkin, MD[12]; Connie Haley, MD, MPH[13]; [1]U.S. Centers for Disease Control and Prevention, Atlanta, Georgia; [2]Puerto Rico Department of Health, San Juan, Puerto Rico ; [3]Illinois Department of Public Health, Chicago, Illinois; [4]Cook County Department of Public Health, Chicago, Illinois; [5]Alabama Department of Public Health, Montgomery, Alabama; [6]Los Angeles County Department of Public Health, Los Angeles, California; [7]New York State Department of Health, Albany, New York; [8]Snohomish Health District TB program, Everett, Washington; [9]Washington State Department of Health, Olympia, Washington; [10]Seattle King County TB Program, seattle, Washington; [11]HealthPartners Institute, Minneapolis, MN; [12]Florida Department of Health, Miami, Florida; [13]Southeastern National TB Center, Gainesville, Florida

**Session:** P-80. Tuberculosis and other Mycobacterial Infections

***Background.*** In August 2019 the U.S. FDA approved pretomanid as part of a 6-month all-oral BPaL (bedaquiline, pretomanid, and linezolid) regimen for treating pulmonary extensively drug-resistant (XDR) or treatment-intolerant or nonresponsive multidrug-resistant (MDR) tuberculosis (TB). In the study supporting approval, 89% of patients had a favorable outcome, and all reported ≥ 1 adverse event. We describe the reported use of BPaL in the United States.

***Methods.*** Using the 2020 CDC Report of a Verified Case of Tuberculosis (RVCT) MDR TB supplemental form, TB programs and providers submitted data for patients who began taking BPaL between Aug 1, 2019 and May 1, 2020, for retrospective descriptive analysis.

***Results.*** Programs and providers reported 17 TB patients aged a mean of 41 years (range 23–76) who received BPaL: 11 (65%) were male; 15 (88%) were non-U.S. born; 15

(88%) had pulmonary TB disease only; two (12%) had both pulmonary and extrapulmonary disease. Of all patients, 16 had *Mycobacterium tuberculosis* isolated from sputum and 7 (44%) had cavitary disease. The preliminary drug susceptibilities were 8 MDR patterns, 8 pre-XDR, and 1 unreported. Three patients received BPaL as their only treatment; six first received treatment for drug-susceptible TB, and eight received other regimens for MDR TB before BPaL. Eleven (65%) patients had ≥ 1 side effect reported during any TB treatment, including peripheral neuropathy (n=5), depression (n=4), vestibular dysfunction (n=3), and vision changes (n=3). Timing related to specific TB drug use was not reported. Sixteen (94%) patients received less than the approved initial dose of 1200 mg linezolid daily, and 15 (88%) patients underwent monitoring of linezolid exposure. All 16 patients with *M. tuberculosis* in initial sputa converted to negative culture results within 6 months of starting treatment. At 12 months after BPaL initiation, all patients had completed treatment, without TB recurrences or deaths reported.

***Conclusion.*** In the early period after FDA approval, most U.S. patients received BPaL off-label with an initial linezolid dose lower than the approved 1200mg yet still achieved good outcomes. Most reported patients underwent some monitoring of linezolid exposure. Monitoring of BPaL use is important and should continue.

***Disclosures.*** **All Authors**: No reported disclosures

**1401. Infliximab for Immune Reconstitution Inflammatory Syndrome (IRIS) in Tuberculous Meningitis; A Treatment Paradox**

Ahad Azeem, MBBS[1]; Faran Ahmad, MBBS[2]; Manasa Velagapudi, MBBS[3]; [1]VA Nebraska-Western Iowa Health Care System/Creighton University School of Medicine, Omaha, Nebraska; [2]Creighton University School of Medicine, Omaha, Nebraska; [3]CHI Health - Creighton University Medical Center - Bergan Mercy, Omaha, Nebraska

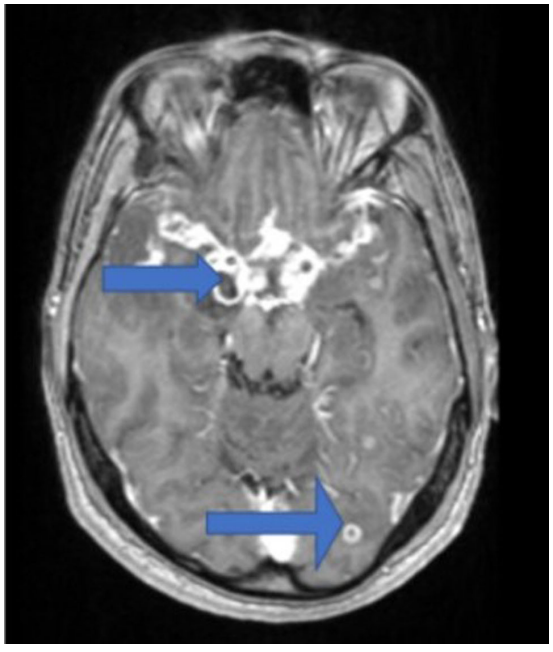
**Session:** P-80. Tuberculosis and other Mycobacterial Infections

***Background.*** Tumor necrosis factor (TNF)-α inhibitors are known for the reactivation of latent tuberculosis (TB). As a paradox, it has been reported to have a role in the treatment of immune reconstitution inflammatory syndrome (IRIS) from anti-TB therapy.

***Methods.*** We report a case of paradoxical worsening of central nervous system TB after initiation of anti-TB medications, which was treated successfully with infliximab (TNF-α inhibitor).

***Results.*** A 34-year-old man from Nepal with a history of untreated latent TB presented with complaints of occipital headache, slurred speech, and witnessed seizure. His physical exam was consistent with hyperreflexia. MRI of the brain revealed multiple small contrast-enhancing lesions in cerebral hemispheres. CT Chest showed bilateral centrilobular nodules suggestive of miliary TB. Cerebrospinal fluid (CSF) analysis showed pleocytosis, high protein, and low glucose. He was started on isoniazid, rifampin, ethambutol, and pyrazinamide along with high-dose dexamethasone for TB meningitis. Later, MTB DNA probe from bronchioalveolar lavage and CSF detected *Mycobacterium Tuberculosis* which was pan-susceptible. Repeat MRI of the brain 6 months into therapy revealed worsening of brain lesions. Moxifloxacin and linezolid were added to the regimen given clinical progression on first-line therapy. 6-months into this enhanced regimen he started experiencing blurring of vision. Visual field mapping showed left homonymous hemianopia. Repeat MRI of the brain confirmed extensive changes of basilar meningitis completely enveloping the optic chiasm. IRIS from TB was suspected. His prednisone dose was increased, and 3-doses of infliximab infusion were, 2-weeks apart were administered which showed clinical and radiological improvement.

MRI Brain



MRI Brain (axial T2/flair sequence) shows hyperintensities in multiple locations including the involvement of the left optic nerve and the left occipital region.

***Conclusion.*** Exacerbation of pre-existing clinical symptoms, formation of new lesions, or cavitation of prior pulmonary infiltrates is known as tuberculosis IRIS or paradoxical reaction. Despite the clinical and radiological exacerbation, mycobacterial cultures usually stay negative. Continuation of anti-TB medications and high-dose corticosteroids are the backbone of treatment but in refractory cases, immune modulation is needed with anti-TNF-α agents.

***Disclosures.*** **All Authors**: No reported disclosures

**1402. NTM Infections; A Rising Global Health Problem/Clinical Characteristics and Outcomes of Patients with Non-Tuberculous Mycobacterial Infections at Two Tertiary Academic Medical Centers**

Abdelhameed Nawwar, MD[1]; Julieta Madrid-Morales, MD[1]; Carolina Velez-Mejia, MD[1]; Rigoberto De Jesus Pizarro, MD[1]; Victor Cepeda, MD[2]; Kelly R. Reveles, PharmD, PhD[3]; Jose Cadena-Zuluaga, MD[4]; Heta Javeri, MD; MPH[5]; [1]University of Texas Health Science Center at San Antonio, Texas, USA, San Antonio, Texas; [2]Southern Illinois Healthcare (SIH), Herrin, Illinois; [3]University of Texas at Austin, San Antonio, TX; [4]University of Texas health and science center San Antonio, Audie L. Murphy VA Medical Center, San Antonio, Texas; [5]UT Health San Antonio, San Antonio, Texas

**Session:** P-80. Tuberculosis and other Mycobacterial Infections

***Background.*** Non-Tuberculous Mycobacteria (NTM) cause infections in immunocompetent as well as immunocompromised individuals affecting pulmonary and extra pulmonary sites. These pathogens are widely distributed globally and recent reports have shown their rise in many developed countries. Our study aimed to assess the disease magnitude, describe patient characteristics and risk factors, assess diagnostic and therapeutic measures and review outcomes furthering our understanding of the overall disease process.

***Methods.*** We conducted a retrospective, multicenter review of patients with positive NTM cultures treated at University Hospital System and South Texas Veterans Health Care System (STVHCS) from 2011 to 2018. Infections were classified as pulmonary or extrapulmonary, and we recorded demographics, microbiological data, treatment regimens, duration, complications, follow-up and mortality. All categorical variables were described using percentages and compared between groups using the chi-square test.

***Results.*** A total of 176 patients were included for analysis, of which 111 (63.1%) met criteria for NTM disease (2020 ATS/IDSA). The most common cultured mycobacterium was M. Avium Complex (MAC). M. abscessus-chelonae was more commonly associated with clinical disease and isolated from an extra pulmonary site whereas M. simiae complex had similar distribution between the infected and un-infected groups. Over 50% of patients received treatment (80% in the infected group). Cure was seen in 47.2%, all-cause mortality was 27% at last follow-up. Median duration of therapy was 10 months. 47% of patients experienced adverse effects which led to treatment discontinuation in one third of patients. Patients who were able to achieve a cure received a longer duration of therapy (12 vs 7 months; not statistically significant) and treatment was halted more commonly in the group that did not achieve eventual cure (42.6% vs. 16.7%, p=0.007).

**Table 1. Characteristics of patients overall (all culture positive patients) and by clinical infection**

| Characteristic | Culture Positive (n=176) | Clinical Infection (n=111) | No Clinical Infection (n=65) | P-value* |
|---|---|---|---|---|
| Age (years), median (IQR) | 66 (56-74) | 62 (53-71) | 70 (61-80) | **0.0003** |
| Male sex, n (%) | 122 (69.7) | 71 (64.0) | 51 (80.0) | **0.0263** |
| Charlson Score, median (IQR) | 4 (2-6) | 4 (2-6) | 5 (4-7) | **0.0009** |
| Pulmonary source, n (%) | 137 (77.8) | 75 (67.6) | 62 (95.4) | **<0.0001** |
| Organism, n (%) | | | | **<0.0001** |
| M. avium complex | 54 (30.7) | 30 (27.0) | 24 (36.9) | |
| M. abscessus-chelonae complex | 44 (25.0) | 40 (36.0) | 4 (6.2) | |
| M. simiae complex | 29 (16.5) | 16 (14.4) | 13 (20.0) | |
| M. gordonae | 21 (11.9) | 5 (4.5) | 16 (24.6) | |
| M. fortuitum | 14 (8.0) | 10 (9.0) | 4 (6.2) | |
| M. kansasii | 8 (4.5) | 7 (6.3) | 1 (1.5) | |
| M. mucogenium | 2 (1.1) | 2 (1.8) | 0 (0.0) | |
| M. szulgai | 2 (1.1) | 0 (0.0) | 2 (3.1) | |
| M. scrofulaceum | 1 (0.6) | 0 (0.0) | 1 (1.5) | |
| M. marinum | 1 (0.6) | 1 (0.9) | 0 (0.0) | |
| Any treatment, n (%) | 93 (52.8) | 89 (80.2) | 4 (6.2) | **<0.0001** |
| Initial treatment, n (%) | | | | |
| Macrolide/ethambutol/rifampin | 88 (50.0) | 84 (75.7) | 4 (6.2) | **<0.0001** |
| Amikacin | 30 (17.0) | 30 (27.0) | 0 (0.0) | **<0.0001** |
| Fluoroquinolone | 19 (10.8) | 19 (17.1) | 0 (0.0) | **<0.0001** |
| Cefoxitin | 10 (5.7) | 10 (9.0) | 0 (0.0) | **0.0020** |
| Imipenem | 3 (1.7) | 3 (2.7) | 0 (0.0) | 0.0945 |
| Tigecycline | 5 (2.8) | 5 (4.5) | 0 (0.0) | **0.0303** |
| Linezolid | 20 (11.4) | 20 (18.0) | 0 (0.0) | **<0.0001** |
| Salvage treatment, n (%) | 15 (8.5) | 15 (13.5) | 0 (0.0) | **0.0001** |
| Treatment duration, median (IQR) | 10 (2-17) | 10 (2-17) | 5 (3-11) | 0.4762 |

*P-value indicates comparison between clinical infection versus no clinical infection
Treatment by bug

**Table 2. Health outcomes of treated patients with clinical infection**

| Characteristic | Overall (n=89) |
|---|---|
| Cure, n (%) | 42 (47.2) |
| Treatment failure, n (%) | 15 (16.9) |
| Relapse/recurrence, n (%) | 8 (9.0) |
| All-cause mortality, n (%) | 24 (27.0) |
| NTM-related mortality, n (%) | 13 (14.6) |
| Adverse effects, n (%) | 42 (47.2) |
| Treatment halted, n (%) | 27 (30.3) |
| Treatment duration, median (IQR) | 10 (2-17) |