Table 1. Clinical Characteristics of Patients with Suspected Pulmonary Tuberculosis

Table 1. Clinical Characteristics of Patients with Suspected Pulmonary Tuberculosis

Variable	Pre-implementation N=137	Post-implementation N=132	*P* value
Age in years - Median (IQR)	59 (48-70)	58 (44-67)	0.224
Male sex - N (%)	89 (65)	88 (66.7)	0.769
Race N (%)			0.402
White	40 (29.2)	36 (27.3)	
Black	70 (51.1)	79 (59.9)	
Asian	5 (3.7)	3 (2.3)	
Other	22 (16.1)	14 (10.6)	
PPD positive - N (%)	7 (5.1)	10 (7.6)	0.406
IGRA positive/indeterminate - N (%)	40 (29.2)	24 (18.2)	0.034*
LTBI – N (%)	22 (16.1)	23 (17.4)	0.764
TB history - N (%)	27 (19.7)	13 (9.9)	0.023*
HIV infection - N (%)	18 (13.1)	25 (18.9)	0.194
Substance abuse - N (%)	50 (36.5)	40 (30.3)	0.282
IVDU - N (%)	18 (13.1)	13 (9.9)	0.398
TB contact - N (%)	21 (15.3)	16 (12.1)	0.445
Homelessness - N (%)	18 (13.1)	12 (9.1)	0.292
Incarceration - N (%)	26 (20)	20 (15.2)	0.405
Health care worker - N (%)	1 (0.7)	1 (0.7)	1
Cancer - N (%)	22 (16.1)	11 (8.3)	0.054
Transplant - N (%)	6 (4.4)	4 (3.0)	0.749
Autoimmune disease - N (%)	14 (10.22)	9 (6.8)	0.319
Immunosuppressed - N (%)	46 (33.6)	39 (29.6)	0.477
Born outside USA - N (%)	20 (14.6)	18 (13.6)	0.821
Signs/Symptoms/Radiology - N (%)			
Fever	49 (35.8)	53 (40.2)	0.459
Chills	36 (26.3)	37 (28.0)	0.747
Shortness of breath	83 (60.6)	74 (56.1)	0.452
Cough	92 (67.2)	84 (63.6)	0.544
Hemoptysis	36 (26.3)	30 (22.7)	0.499
Night sweats	16 (11.7)	31 (23.5)	0.011*
Weight loss	43 (31.4)	46 (34.9)	0.546
Asymptomatic	11 (8.03)	19 (14.4)	0.097
Abnormal CXR	95 (69.3)	115 (87.1)	0.0004*
Abnormal CT chest	112 (81.8)	111 (84.1)	0.611
AFB smear positive - N (%)	17 (12.4)	13 (9.9)	0.505
Any mycobacterial culture positive - N (%)	34 (24.8)	20 (15.2)	0.048*
Mycobacterium tuberculosis culture positive - N (%)	4 (2.9)	5 (3.8)	0.954
Non-TB mycobacteria culture positive - N (%)	30 (23.4)	15 (12.1)	0.030*

Abbreviations: IQR, interquartile range; PPD, purified protein derivative; IGRA, interferon gamma release assay; LTBI, history of latent tuberculosis infection; TB, *Mycobacterium tuberculosis*; HIV, human immunodeficiency virus; IVDU, intravenous drug use; CXR, chest X-ray; CT, cat scan; USA, United States of America; AFB, acid fast bacillus smear; *, p value <0.005.

Table 2. Turnaround times (TAT) of AFB and GeneXpert/MTB (Xpert) RIF before and after implementation

Table 2. Turnaround times (TAT) of AFB and GeneXpert/MTB (Xpert) RIF before and after implementation

Phase	TAT (N)	Median	IQR
Pre-implementation N=137	AFB 1 (N=126)	21.28	12.93-28.42
	AFB 2 (N=115)	23.87	11.75-30.02
	AFB 3 (N=105)	21	10.75-30.95
Post-implementation N=132	AFB 1 (N=121)	23.63	14.72-30.42
	AFB 2 (N=98)	24.84	18.87-30.82
	AFB 3 (N=78)	20.99	11.65-28.20
	Xpert 1 (N=76)*	6.35	4.29-13.41
	Xpert 2 (N=51)*	6.18	4.45-10.10

Abbreviations: TAT, turnaround time; IQR, interquartile range; AFB, acid-fast bacillus smear; *, TAT with p value <0.0001.

Table 3. Duration of Airborne Isolation, Total Turn-Around Times, and Hospital Length of Stay in the Pre- and Post-implementation Period

Table 3. Duration of Airborne Isolation, Total Turn-Around Times, and Hospital Length of Stay in the Pre- and Post-implementation Period

Variable	Pre-implementation	Post-implementation	*P* value
Duration of airborne isolation (Mean, SD) Hours	93.7 (111.7)	70.2 (44.6)	0.031
Total turnaround time[a] (Mean, SD) Hours	52.57 (41.05)	19.21 (15.92)	<0.0001
Length of stay in hospital (Mean, SD) Days	10.5 (11.8)	9.7 (6.9)	0.496

Abbreviations: SD, standard deviation.
[a] Total turnaround time, time from first sample collection to final result of all samples

Conclusion: Implementation of rapid direct molecular testing reduced the duration of respiratory isolation for patients with suspected pulmonary TB. Further provider education regarding the reliability of GXTB in excluding TB may be necessary to reduce overall hospital LOS.

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

670. Rapid, Non-invasive Detection of Invasive Mycoplasma hominis Infection using the Karius Test, A Next-Generation Sequencing Test for Microbial Cell-free DNA in Plasma

Priya Edward, MD[1]; William V. La Via, MD[2]; Mehreen Arshad, MBBS[3]; Kiran Gajurel, MD[4]; [1]Lurie Children's Hospital, Chicago, Illinois; [2]Karius, Pacific Palisades, California; [3]Lurie Children's Hospital/Northwestern Univ., Chicago, Illinois; [4]Carolinas Medical Center, Charlotte, North Carolina

Session: P-25. Diagnostics: Bacteriology/mycobacteriology

Background: *Mycoplasma hominis* is typically associated with genital infections in women and is a rare cause of musculoskeletal infections often in immunocompromised hosts. Diagnosis of invasive *Mycoplasma hominis* infections are difficult due to challenges in culturing these organisms. Molecular diagnostics require an index of suspicion which may not be present at the time of tissue sampling. Accurate, rapid diagnosis of *Mycoplasma hominis* infections are important for antibiotic management.

Methods: Two cases of invasive *Mycoplasma hominis* infections are presented in which the Karius test (KT) was used to make the diagnosis. The KT is a CLIA certified/CAP-accredited next-generation sequencing (NGS) plasma test that detects microbial cell-free DNA (mcfDNA). After mcfDNA is extracted and NGS performed, human reads are removed and remaining sequences are aligned to a curated database of > 1400 organisms. Organisms present above a statistical threshold are reported. Case review was performed for clinical correlation.

Results: A young woman with lupus nephritis status post renal transplant developed persistent fever with progressive multifocal culture-negative osteoarticular infection despite empiric ceftriaxone. An adolescent female presented with an ascending pelvic infection progressing to purulent polymicrobial peritonitis (see table) requiring surgical debridement and cefipime, metronidazole and micafungin therapy; her course was complicated by progressive peritonitis/abscesses. Karius testing detected high-levels of *Mycoplasma hominis* mcfDNA in both cases – at 3251 molecules/microliter (MPM) in the first case and 3914 MPM in the second case. The normal range of *Mycoplasma hominis* mcfDNA in a cohort of 684 normal adults is 0 MPM. The patients rapidly improved with atypical coverage with doxycycline and levofloxaxin.

Clinical findings in 2 patients with M. hominis infection detected by the Karius Test

Parameter	Case 1	Case 2
Age	26	15
Gender	Female	Female
Pre/comorbid underlying condition(s) or immunocompromised state	Renal transplant, SLE	none
Immunosuppressive medications (if applicable)	Mycophenolate, tacrolimus, prednisone (5mg/day), hydroxychloroquine. Recent alemtuzumab	none
Presenting symptoms of infection and duration	Right hip pain for 13 days	PID, septic shock
Antecedent symptoms (URI, genital infection*, etc.)	None	PID
T max/Fever at presentation	Afebrile (later had self-resolving fever)	Persistently febrile T max 39.9 until post drainage
WBC with %N	13.5k with 98% neutrophils (admission)	14.6k with 74% neutrophils (admission)
ESR mm per hr/CRP mg per dL	Max ESR 108 (day 20 post adm); Max CRP 14.7 (day 20 post admit)	Max ESR 58; Max CRP 22.6 (day prior to abscess drainage)
Blood culture result	negative	negative
Pharyngeal RS/culture and/or MRSA/MSSA surveillance culture	Not done	Not done
Other culture or infectious diseases test	See below*	Polymicrobial (*Streptococcus agalactiae, Streptococcus dysgalactiae, Fusobacterium necroforum, Staph. aureus* (MSSA), *Prevotella* spp., and *Candida glabrata*)
Location and type of infection (osteo/septic arthritis/myositis/abscess)	Septic arthritis of right hip, right wrist and bilateral shoulder joints	PID with necrotizing uterus/ovaries s/p debridement with multiple subsequent abscesses abdominal and pelvic abscesses
MSK biopsy fluid parameters results (WBC with %N)	Right wrist (56k with 93% segs)	Not done
MSK biopsy culture or molecular (16S) results	Not done	16S from abscess fluid with *Ureaplasma parvum*
Imaging modality	MRI pelvis showed R sacroiliitis and sacral osteomyelitis	Multiple large abdominal/pelvic Abscesses noted on abdominal CTs as well as abdominal MRI and Abdominal US
	X ray of right wrist and shoulder-unremarkable	
Empiric antibiotics	vancomycin + ceftriaxone	cefepime + metronidazole + micafungin
Antibiotic treatment duration prior to Karius Test	18 days	4 weeks
Choice of antibiotics after Karius Test and (clinical impact)	doxycycline+ levofloxacin (clinical improvement)	doxycycline + piperacillin/tazobactam+ micafungin (clinical improvement)
Karius Test impact on decision to biopsy	No biopsy done	No further drainage of abscesses
Duration of antibiotics (IV/PO)	6 weeks after diagnosis	7 weeks total (10 days of doxycycline)
Duration of hospitalization	35 days (excluding rehab)	8 weeks (still hospitalized for non-infectious complications)
Outcome	Near resolution of symptoms	Resolution of abscesses
Time to result from Karius Test collection	2 days	4 days
Time to result from Karius Test sample receipt	1 days	2 days
Karius Test result molecule/microliter (MPM)	Mycoplasma hominis 3251 MPM	*Mycoplasma hominis* 3914 MPM *Streptococcus dysgalactiae* 393 MPM *Fusobacterium necrophorum* 583 MPM CMV 3997 MPM EBV 812 MPM**

[1]Infectious work up:

* CT chest; routine blood and urine cultures; blood AFB and fungal cultures; serum Parvovirus PCR; Lyme serology; Brucella serology; bartonella serology and PCR; serum cryptococcal antigen; serum galactomannan and 1,3 BDG; urine coccidioides antigen; serum and urine histoplasma antigen; and rapid plasma regain tested were all negative.

***Ureaplasma parvum* reads were present in the raw data

Conclusion: Open-ended, plasma-based NGS for mcfDNA provides a rapid, non-invasive method to diagnose invasive *Mycoplasma hominis* infection. This case series highlights the potential to diagnose infections caused by fastidious pathogens to better inform antimicrobial therapy and achieve favorable outcomes.

Disclosures: William V. La Via, MD, Karius (Employee)

671. Same Day Identification of Enterobacteriaceae Directly from Urine Samples

Shelley E. Kon, MD[1]; Sara Giddins, MT(ASCP), MS[2]; Irina Yushkevich, MLS[2]; Martin Fuchs, BSEE, MSEE[3]; Amy Irwin, RN, DNP[2]; Steve Metzger, BA[3]; Connie S. Price, MD[4]; [1]University of Colorado, Denver, Colorado; [2]Denver Health and Hospital, Denver, Colorado; [3]Accelerate Diagnostics, Tucson, Arizona; [4]Denver Health and Hospital, University of Colorado School of Medicine, Denver, CO

Session: P-25. Diagnostics: Bacteriology/mycobacteriology

Background: Urinary tract infections (UTIs) are one of the most common infections, associated with 10.5 million outpatient visits annually. Fast and accurate identification (ID) of bacteria causing a UTI would allow for immediate targeted therapy, as opposed to conventional methods which take one to three days. The Accelerate Pheno™