Final Abstract Number: 40.005
Session: Oral Presentations: HIV / Tuberculosis
Date: Saturday, March 3, 2018
Time: 15:15-16:45
Room: Retiro A

Type: Oral Presentation

Time to change our diagnostics to win the battle against TB in Paksitan

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Background: Pakistan ranked as 4th in the world for tuberculosis burden[5]. In Pakistan, the incidence of TB is 231/100, 0002 with prevailing prevalence and mortality of 310/100,000 and 39/100,000 16 respectively Sputum smear microscopy is a routine test done in all the patients suspecting to have pulmonary tuberculosis. Diagnosis becomes challenging when patient has smear result as negative for Acid Fast Bacilli (AFB). Present study was done to assess the importance of Xpert MTB/RIF assay for the diagnosis of tuberculosis in patients negative for AFB on sputum smear.

Methods & Materials: An observational study done at at Federal General Hospital (FGH), Islamabad from June 2015- 30th June 2016. After taking informed consent, two sputum samples of each patient were sent to TB reference laboratory, one processed for smear microscopy and second for Gene Xpert (MTB/RIF). Data was obtained and analyzed by SPSS 14.

Results: There were total 201 cases. Mean age of 36 years (±SD 2.8). Most of the patients were in 13-33 years age group, young adult group. Out of 201, 72 (36%) samples were positive and 129 (64%) negative using Xpert® MTB/RIF assay whereas 52 (26%) were positive and 149 (74%) were negative for AFB using microscopy. Only 2 (3%) were resistant to rifampicin on Xpert and both resistant cases were females. Sensitivity and specificity of microscopy was 71% and 99% respectively where as positive predictive value (PPV) and negative predictive values (NPP) were 98% and 86% respectively resulting in accuracy of microscopy to be 46% only.

Conclusion: Gene Xpert MTB/RIF assay is much more sensitive and specific then sputum microscopy. At the same time information given about rifampicin resistance and availability of the result in almost 2 to 3 hours with fully automated process makes it very much useful in the diagnosis of tuberculosis. Sputum culture was not performed among study participants as it is a gold standard diagnostic for TB diagnosis so accurate sensitivity and specificity of Xpert MTB/RIF assay could not be established. It is recommended that any person with cough for two weeks or more with unexplained chronic fever and/or weight loss should be assessed for TB

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Evolution of virulent genotypes and an emerging threat of multidrug resistant tuberculosis in Bamako, Mali

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Background: Bamako, Mali, has a well-structured hierarchy for tuberculosis (TB) case management. However, in recent years Bamako has been faced with an emerging threat from multidrug resistant TB (MDR-TB). Here we present insights into the genomic epidemiology of TB and the evolutionary mechanisms driving the emergence of MDR-TB in Bamako.

Methods & Materials: Isolates recovered from tuberculosis patients from local reference centers and the University Teaching Hospital at Point G, in Bamako, Mali between 2006 and 2012 (n = 208), were tested for antimicrobial susceptibility at the MRC Unit The Gambia. A subset of 76 isolates were analysed using whole genome sequencing. A time dated phylogenetic tree was reconstructed using BEAST. Lineage and resistance conferring mutations were inferred using PhyResSe.

Results: Patients included 21 females and 55 males aged between 3 to 78 years, among whom 12(16%) were infected by MDR-TB. Most patients 61(80%) were new cases and among 15 retreatment cases 9(60%) were MDR-TB. The phylogeny was reconstructed from 8508 variant core genome sites. The dominant lineage was the Euro-American super lineage, lineage 4. Within lineage 4, the Cameroon genotype was the most prevalent genotype (n = 20, 26%) followed by the Ghana genotype (n = 16, 21%). Cameroon genotype isolates diverged from a common recent ancestor ~161 years ago to form three clusters, one of which emerged ~22 years ago and is likely to be involved in on-going transmission. Seven Ghana genotype isolates were MDR-TB representing over half all MDR-TB in this dataset (7/12). Ghana genotype isolates were more likely to cause MDR-TB than other genotypes after controlling for treatment status (OR = 5.6, p-value = 0.043). The MDR-TB Ghana genotype isolates formed a clade that diverged approximately 30 years ago, in which the *katG*Ser315Thr mutation was conserved. Other Euro-American genotypes included the six LAM, two H37Rv-like and one Uganda. Four patients were infected with closely related Beijing strains and five patients were infected with non-MDR *Mycobacterium africanum*2.

Conclusion: The Cameroon and Ghana genotypes are endemic to West Africa. Their association with on-going spread and MDR-TB in Bamako respectively is a major concern. The rise of Beijing genotype in Bamako is worrying given its high transmissibility and virulence.

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Type: Invited Presentation

Leprosy

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Leprosy is a disease associated with great stigma due to the deformities it can produce. It is caused *by Mycobacterium leprae*. In 2008 a new mycobacteria, *M. lepromatosis* was recognized as the agent of Lucio leprosy.

It is not known how leprosy is transmitted. Only infected people with a defect in their cell-mediated immunity, which is specific for *M. leprae*, develop the disease. Those with still high immunity will develop tuberculoid leprosy (TT), with a single skin lesion and no detectable bacilli; those with no CMI will develop lepromatous leprosy (LL), with areas of skin infiltrated by foamy histiocytes filled with leprosy bacilli. In between are the borderline patients, borderline tuberculoid (BT), mid-borderline (BB), and borderline lepromatous (BL), with decreasing levels of CMI and increasing bacillary load.

For therapy, according to the WHO, patients are divided in paucibacillary (PB) (negative slit-skin smears, i.e. Indeterminate, TT, and BT) and multibacillary (MB) (positive slit-skin smears, i.e. BB, BL, and LL). PB patients are treated with six months of dapsone plus rifampicin; MB patients are treated with 12 months of dapsone plus rifampicin plus clofazimine.

Two types of hypersensitivity reactions may occur, type 1 and type 2. Type 1 reaction is considered to be due to a change in the CMI and only happens in borderline patients (BT,BB,BL). It produces inflammation of the skin lesions and/or nerves; the drug of choice for it is prednisone. Type 2 reaction is considered to be due to antigen-antibody deposition in tissues, and only happens in BL and LL patients. The most common presentation is erythema nodosum leprosum, but it may present with fever and inflammation of several organs. The drug of choice for a severe reaction is thalidomide, but in a woman of child-bearing age it is contraindicated and prednisone should be used.

Leprosy is a disease that can be easily diagnosed, and with appropriate early therapy can be cured with no sequelae.

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Room: Libertador A

Type: Invited Presentation

Innovative disease surveillance

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Over the past fifteen years, Internet technology has significantly changed the landscape of public health surveillance and epidemic intelligence gathering. Disease and outbreak data is disseminated not only through formal online announcements by government agencies, but also through informal channels such as social networking sites, blogs, chat rooms, Web searches, local news media and crowdsourcing platforms. These data streams have been credited with decreasing the time between an outbreak and formal recognition of an outbreak, allowing for an expedited response to the public health threat. Collectively, these online sources create an image of global public health that is fundamentally different from the one produced by traditional public health surveillance infrastructure.

Dr. Brownstein will discuss the current capabilities and future directions in the use of the nontraditional data sources for the purposes of public health surveillance and rapid detection of emerging infectious diseases.

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Type: Invited Presentation

Critical care considerations and pandemic preparedness

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Critical care units are a vital component of pandemic preparedness. In a severe pandemic of a respiratory viral illness, it is likely that critical care resources will be stretched tremendously. Even for non-respiratory illnesses such as encephalitis or one of the hemorrhagic fever syndromes, there will be a significant demand for mechanical ventilation, hemodynamic monitoring and all the other elements of a modern critical care unit. While critical care is costly and resource intensive, it can result in dramatic “cures” which have enormous intangible benefits for healthcare worker morale. In addition, there is no doubt that safe and effective critical care can improve outcomes, encourage sick individuals to seek medical attention early and mitigate the devastating consequences of a severe pandemic. At the same time, it is important to realise that in a setting with vulnerable patients who may be immunocompromised, a high intensity of medical device use and stretched staff, there are significant risks of nosocomial transmission of either the pandemic pathogen or other infectious agents. It is thus vital that basic infection control practices are not compromised in critical care units even in the face of a pandemic. Ultimately, good planning that incorporates training, education and resource allocation