Mycobacterium Tuberculosis Infection Detection

Tuesday, 25 March 2014
Cineworld: The O2, London, SE10 0DX, UK
www.regonline.co.uk/TBDetection2014

This meeting discusses the development of adequate, patient needs-driven, low-cost new TB diagnostic tests. New research into TB detection as well as development of current methodologies will be examined in an informal setting with plenty of opportunity for debate and networking. This event is part of the **2014 TB Summit:** www.TBSummit2014.com This event has CPD accreditation.

Meeting Chair: *Professor Philip Hill*, McAuley Professor and Co-Director, Centre for International Health, New Zealand

The deadline for abstract submissions for oral presentation has now passed. Abstracts for *poster presentation only* can be submitted up to two weeks before the event. You can download the instructions for authors at
www.euroscicon.com/AbstractsForOralAndPosterPresentation.pdf

Talk times include 5 – 10 minutes for questions

9:30 – 10:15 **Registration**

10:15 - 10:45 **Introduction by the Chair**: *Professor Philip Hill*, McAuley Professor and Co-Director, Centre for International Health, New Zealand

The diagnosis of Mycobacterium tuberculosis infection. Where to from here?
Professor Philip Hill, McAuley Professor of International Health, University of Otago, New Zealand
Elimination of Tuberculosis will require a major new focus on combating latent tuberculosis infection. To facilitate this, a new generation of diagnostic tests would be helpful to narrow down the number of individuals that should be given preventive treatment. Current thinking about host-pathogen interactions, together with new technologies, makes it timely to re-consider new targets for the development of new diagnostic tests. There is good evidence that early clearance of M. tuberculosis by the innate immune system occurs. A profile or bio-signature of early clearance should be identifiable. It is also likely that there is on-going clearance by the adaptive immune system. There is evidence that LTBI manifests in a several different forms. However, this occurs both within and between individuals. There is little evidence that any pathological or biomarker differences observed so far predict likelihood of progression to disease. While physical sub-phenotypes may be problematic, bio-profile 'phenotypes' offer some promise. The development of the next generation of diagnostic tests for M. tuberculosis exposure and infection is challenging but could focus on early clearance after exposure to M. tuberculosis and prognostic biomarker profiles.

10:45 - 11:15 **Rapid and sensitive phage-based detection of mycobacteria in blood and potential for use as a DIVA test**
Dr Catherine E.D. Rees, Associate Professor in Microbiology, School of Biosciences, University of

Nottingham, UK
Combining the bacteriophage-based FASTPlaqueTB technology with PCR creates a rapid, specific method that detects any slow growing mycobacteria, including human and bovine TB within 48 h. We recently demonstrated the detection of MAP (Johne's disease) in blood samples from infected cattle before any clinical signs of disease and also in blood from ELISA-negative animals. The method is also applicable to ovine and equine blood samples and we are developing a new assay format for high through-put testing and detection within 5 h. We are also investigating whether this technology can form the basis of a DIVA test for bovine TB.

11:15 - 11:40 **Speakers' photo then mid-morning break and poster exhibition and trade show**

Please try to visit all the exhibition stands during your day at this event. Not only do our sponsors enable Euroscicon to keep the registration fees competitive, but they are also here specifically to talk to you.

11:40 - 12:10 **Monitoring host response for TB patient management**

Dr Richard M. Anthony, Research Coordinator Tuberculosis, KIT Biomedical Research, The Netherlands
We propose the use of immunological assays to monitor ongoing treatment effect in tuberculosis (Motet) (den Hertog, PLoSONE 2011). The Motet strategy consists measuring the immunological response to the first few a few doses of TB drugs and detecting any treatment response. Although 6 months of treatment is required to cure TB a high percentage of bacteria is rapidly killed when starting therapy. After demonstrating the feasibility in a mouse model an initial proof of concept in humans was performed. Measured responses were associated with gold standard molecular and culture based testing; work is ongoing to confirm this exciting possibility.

12:10 - 12:40 **How Does Lipoarabinomannan (LAM) Enter The Urine; Histological Studies From Uganda**

Mrs Janneke Cox, Institute of Tropical Medicine, Belgium

12:40 - 13:30 **Lunch, poster exhibition and trade show**

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13:30 – 14:00 **Discussion Session**

This discussion session is an informal question and answer session. This is an ideal opportunity to get advice and opinion from experts in this area. This session is not for questions about specific talks, which can be asked after the speakers session, but for discussing either general topics or specific issues. There are three ways you can ask questions:

1. Before the session you can *submit your question to Euroscicon staff* at the registration desk,
2. Before and during the session you can *submit a question or comments, by email*, which will be provided on the day of the event
3. During the session you can *put your hand up* and join in

14:00 - 14:30 **Tuberculosis in cats and dogs – New information on diagnostic**

testing, incubation period, speed of disease progression, zoonotic and nosocomial risks

Professor Danielle Gunn-Moore, Easterbush Veterinary Centre, Roslin, Edinburgh, Scotland
TB occurs in cats and dogs in the UK. In cats it is caused by M. microti or M. bovis. It is much rarer in dogs than cats, and most often caused by M. tuberculosis or M. bovis. This Abstract describes two case clusters which show that our newly developed interferon gamma (IFN gamma) response assays for canine and feline TB are useful in the diagnosis and monitoring of these cases. In addition, we show that M. bovis can have startlingly short incubation periods and rapid disease progression in cats, and these infections can pose significant zoonotic and nosocomial risk.

14: 30 – 15:00 **Atypical Cases of the Musculoskeletal Tuberculosis: A Dilemma for Diagnosis & Treatment**
Dr Ashok Kumar, Consultant Orthopaedic Surgeon, Dubai Bone & Joint Center, Mohd Bin Rashid Al Maktoum Academic Medical Center, Dubai Health Carecity, Dubai, UAE
Tuberculosis is as old as mankind. Musculoskeletal tuberculosis is a fairly common form of tuberculosis in the developing world. Atypical musculoskeletal tuberculosis involve unusual sites, mild to severe clinical presentation, confusing laboratory results and unpredictable response to different available anti-tuberculosis drugs regimens. These atypical presentations may lead to delay in diagnosis and treatment. A thorough clinico-radiographic evaluation, combined with histopathological & lab evaluation is essential to establish the early diagnosis and adequate treatment to prevent or minimize the morbidity in such cases.

15:00 – 15:30 **Afternoon Tea, last poster session and trade show**

15:30 – 16:00 **The immunodiagnosis of childhood tuberculosis - old wisdoms and new insights**
Dr Marc Tebruegge, National Institute for Health Research Academic Clinical Lecturer in Padiatric Infectious Diseases & Immunology, Academic Unit of Clinical & Experimental Sciences, Faculty of Medicine, University of Southampton and Department of Paediatrics, The University of Melbourne, UK/Australia
The diagnosis of TB in children remains challenging. Microbiological tests have far lower yields in children compared with adults. Existing immunological tests also have important limitations. The tuberculin skin test (TST) has limited specificity, since the test substance (purified protein derivative) represents a heterogeneous mixture of mycobacterial peptides. The performance of interferon-gamma release assays (IGRA), which are based on the use of relatively Mycobacterium tuberculosis-specific antigens (ESAT-6 and CFP-10) as stimulatory antigens, is also considerably less robust in children than in adults. This talk will review published and novel data to elucidate the reasons for the suboptimal performance of IGRA in children, and explore the underlying mechanisms of discordance between TST and IGRA results.

16:00 – 16:30 **TB in Camelids - new diagnostic tools**
Dr Shelley Rhodes, Immunologist, Animal Health and Veterinary Laboratories Agency, UK
There is a growing south American camelid (SAC) industry in Great Britain. They are used for breeding and showing, kept as producers of fibre, as pets, working (trekking) and companion animals. More than half of the national SAC herd are to be found in the south west of Britain where bovine tuberculosis (BTB)

is most prevalent. SAC are susceptible to TB. Genotyping of M. bovis isolates from SAC TB breakdowns has largely reflected the pattern of the predominant genotype(s) found in the neighbouring cattle and local wildlife. There is currently no BTB surveillance testing for SAC, and so by the time infection is detected, the pathology can be advanced. The camelid industry itself recognised this problem and, in view of the limited sensitivity of the tuberculin skin test in camelids, funded an a blood test validation project with the AHVLA. As a result, we now have a suite of antibody tests that, whilst not perfect, could detect infected SAC in confirmed BTB breakdown herds and potentially also be used for routine herd surveillance and pre-movement testing. The test validation project has provided tools for the control of TB in camelids, which could limit the spread of this disease within the British camelid population and help mitigate any risk of camelids acting as vectors of M. bovis infection for other animals and humans.

16:30 - 17:00 **Serum IP-10 Profile During Early Phase Of Pulmonary Tuberculosis Chemotherapy**

Dr Rachel Saunders, Liverpool School of Tropical Medicine, UK

17:00 **Chairman's summing up and Close of Meeting**

Registration Website: www.regonline.co.uk/TBDetection2014

Meeting reports from this event will be published by Virulence and by HONNAO publishing

Keywords: TB, latent, infection, diagnosis, IGRA,Latent TB; M/XDRTB; genome; proteome; immunome, cell wall, arabinogalactan, drug discovery, benzothiazinone, tuberculosis; treatment; biomarkers; antibiotics, mutation, rpoB, gyrA, gyrB, katG, inhA, Rifampicin resistance, Fluoroquinolone resistance, Isoniazid resistance, Mycobacterium tuberculosis, Thailand, Mangosteen extract, Antimycobacterial activity, air filter, pre-filter, Atypical, Musculoskeletal, Tuberculosis, Dilemma, Management, alpaca, llama, bovine TB, diagnosis, Mycobacterium tuberculosis Complex, Common Non-Tuberculous Mycobacteria, Identification Multiplex Real-TimePCR, tuberculosis, child, diagnosis, cytokines, immunology, M. tuberculosis infection Diagnostic tests, Phenotypes, Early clearance, Bacteriophage, detection, MAP, DIVA test, Tuberculosis, treatment, diagnostics, MDR-TB

About the Chair

Philip Hill is the first holder of the McAuley Chair of International Health, was the Foundation Director of the Centre for International Health (2008-2012) at the University of Otago, New Zealand and is now co-Director of the Centre. Professor Hill holds separate qualifications as a medical practitioner (MB ChB), specialist public health physician (FAFPHM), specialist infectious diseases physician (FRACP), as well as a doctorate in the epidemiology of tuberculosis in The Gambia, West Africa (MD). After completing specialty training in Auckland, New Zealand, he spent six years working as a clinical epidemiologist for the MRC Laboratories in The Gambia. While there he led the tuberculosis research group. He now has formal collaborations in tuberculosis research also with the University of Padjadjaran and European and Canadian partners in Indonesia. He supervises postgraduate students on projects in several other countries around the world. Prof Hill has been a lead or co-investigator on grants worth more than $20 million since 2001, including three Gates Foundation grants, MRC(UK) grants, European Commission/Union grants, DFID (UK) grants, and Global Fund grants. His tuberculosis research interests

include studies of Mycobacterium tuberculosis infection and disease, with a focus on tuberculosis case contact studies in developing countries.

About the Speakers

Cath Rees is currently Associate Professor in the Microbiology and Food Safety group at Nottingham University. Originally she studied Biochemistry at Oxford, followed by PhD in Genetics at Leicester University and has since used her training in bacterial genetics to study various aspects of applied microbiology. She moved to Nottingham in 1989 to develop recombinant phage-based methods of detection of Listeria and now also studies the biology and genetics of this organism. Her research group works on a variety of projects involving phage, from development of rapid phage-based tests to the development of novel phage-based vaccines.

Richard Anthony has more than 10 years experience with the development and implementation of tuberculosis diagnostics.
He currently leads a group of researchers at the Royal Tropical Institute (KIT) in Amsterdam focused on the diagnosis, identification, and detection of antibiotic resistance of mycobacterial species. This work ranges from updating microscopic protocols to the development of molecular assays.

Janneke Cox: PhD student at the Institute of Tropical Medicine in Antwerp, Belgium and affiliated to the Infectious Diseases Institute in Kampala, Uganda. Medical doctor in training for medicine / infectious diseases specialty at the Leiden University Medical Center in the Netherlands.

Ashok Kumar graduated from University College of Medical Sciences, Delhi in 1996. He completed his postgraduate training in Orthopedics from All India Institute of Medical Sciences, Delhi (2004). He did his fellowship in Trauma & Orthopedics from Katharnein Hospital, Germany and in Joint replacement from Exeter Hip Center, U.K. He passed his MRCS, Glasgow, U. K in 2009. He has published more than 25 papers in various indexed international Orthopedics journals. He is currently working as a Consultant Orthopedic Surgeon at Dubai Bone and Joint Center. His area of interest includes, Pediatric Orthopedics, hip/knee replacement & Trauma, Oncology.

Marc Tebruegge trained in Paediatrics and Paediatric Infectious Diseases, at a number of renowned UK hospitals, including King's College Hospital, St. Mary's Hospital London and Great Ormond Street Hospital. Between 2007-2011 he undertook a PhD focusing on the immunodiagnosis of tuberculosis in children at the University of Melbourne. He returned to the UK in 2011 to take up his current position as NIHR Academic Clinical Lecturer in Paediatric Infectious Diseases & Immunology at the University of Southampton. To date he has authored more than 60 publications in peer-reviewed journals and 8 book chapters, which includes chapters in the RCPCH Manual of Childhood Infections and the reference textbook Principles and Practice of Pediatric Infectious Diseases. He also serves on the Editorial Board of several journals, including the Pediatric Infectious Disease Journal (ESPID Reviews and Reports section) and PLoS ONE.

Shelley Rhodes (PhD, Imperial College, London), has been part of the TB Research Team at the Animal Health and Veterinary Laboratories Agency for 15 years, investigating aspects of immunity of cattle to infection with Mycobacterium bovis. For the past 5 years she has also been the project manager and test

consultant for national bovine TB interferon-gamma testing in Great Britain. With an increased interest in diagnostics, she has in addition been involved in the testing of new cattle serological TB tests, TB diagnostic tests for domestic cats, one of which is now commercially available, and more recently the validation of TB tests for south American camelids.

Danièlle Gunn-Moore graduated with from the R(D)SVS, University of Edinburgh. After a year in small animal practice she joined The Feline Centre, University of Bristol, as the Feline Advisory Bureau Scholar, then Duphar Feline Fellow, and completed her PhD into Feline Infectious Peritonitis in 1997. After a short period as Lecturer in Veterinary Pathology, University of Bristol, she returned to Edinburgh to establish the Feline Clinic and is now Professor of Feline Medicine. She is interested in all aspects of feline medicine; she is an internationally recognised expert in her area, lectures extensively and her work has been published widely.

POSTER PRESENTATIONS

HOW DOES LIPOARABINOMANNAN (LAM) ENTER THE URINE; HISTOLOGICAL STUDIES FROM UGANDA

J.A. Cox, R.L. Lukande, S. Kalungi, E. Van Marck, K. Van de Vijver, R. Colebunders, A. Kambugu, Y.C. Manabe

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Introduction: Lipoarabinomannan (LAM), a lipopolysaccharide component of the mycobacterial cell wall, can be detected in urine with several antigen assays including a point-of-care lateral flow assay (Determine TB-LAM). LAM antigen detection has the highest diagnostic accuracy in severely immunosuppressed HIV-infected patients. In an autopsy cohort of hospitalized Ugandan HIV-infected adults we sought to correlate the outcomes of urinary LAM-antigen testing with the histological findings in kidney tissue. Methods: From February-June 2013, we performed complete autopsies in HIV-infected adults who died on the medicine wards of Mulago hospital in Kampala. Kidney histology was assessed in all patients. In case of suspicion of TB (granuloma formation, presence of giant cells, (caseous) necrosis or focal inflammation not otherwise explained) additional Ziehl Neelsen (ZN) staining was done. Urine was collected postmortem and stored at -20° in sterile containers. A LAM lateral flow assay (LFA) (Determine TB-LAM®, Alere, Waltham, MA, USA) and a LAM ELISA assay (Clearview® TB ELISA, Alere) were performed on thawed samples according to the manufacturer's instructions. For the LAM LFA, the grade 1 cut-point was used for positivity. The lab-technicians reading the LAM-antigen testing were blinded to the histology results and the pathologists reading the kidney histology were blinded to the LAM test results. Results: Ninety-six autopsies were performed; 41 patients were diagnosed with tuberculosis. For 37 patients (39%) sufficient urine and kidney tissue was available for further testing. The median age was 37 years (IQR 30-40), the median CD4 count 42 cells/μL (IQR 13-101), 20 patients (54%, 95%CI 37-71) were on antiretroviral therapy for a median duration of 21 days (IQR 14-183) and 8 patients (22%, 95%CI 8-36) were on anti-TB treatment for a median duration of 14 days (IQR 8-36). Ten patients (27%; 95% CI 12-42) had both a positive LAM ELISA and LAM LFA. Of these, 7 had histological abnormalities in their kidneys suggestive of TB; 5 with acid-fast bacilli (AFB's) and 2 without AFB's upon ZN staining. The latter 2 did have disseminated TB with AFB's upon ZN staining of other organs. The remaining 3 patients with

positivity on both assays had disseminated TB, but no histological abnormalities suggestive of TB in the kidneys. Three patients (8%; 95% CI 2-22) had a positive LAM LFA but a negative LAM ELISA. Of the 3, one had multiple, AFB negative granulomas in the kidney and two had disseminated TB without histological abnormalities suggestive of TB in the kidneys. For 24 patients both LAM tests were negative. Of these, 3 had disseminated TB and one an unspecified granulomatous disease, all without histological abnormalities suggestive of TB in the kidneys. The remaining 20 patients had no signs of TB infection. The cause of death in these patients included disseminated fungal infections (*Cryptococcus neoformans, Aspergillus* and *Candida*), bacterial infections and malignancies (Kaposi's sarcoma). Glomerulopathy as part of HIV-associated nephropathy was found in 3 patients. All 3 patients had TB without histological abnormalities suggestive of TB in the kidneys. For one patient both LAM tests were positive, for one only the LAM LFA was positive and for one both tests were negative. Conclusion: The majority of LAM positivity (70% of LAM ELISA and LAM LFA positive patients and 62% of LAM LFA positive patients) in deceased hospitalized HIV-infected adults was the result of TB infection of the kidneys. Glomerulopathy did not seem an important reason for LAM positivity.

SERUM IP-10 PROFILE DURING EARLY PHASE OF PULMONARY TUBERCULOSIS CHEMOTHERAPY

R L Saunders [1], M R Blakiston[1], L Lawson[2], R Anthony[3], G Harper[1] and L E Cuevas [1]
Email correspondence to hlrsaund@liverpool.ac.uk
Written correspondence to L E Cuevas: Liverpool School of Tropical Medicine, Liverpool, Merseyside, L3 5QA England.

Introduction Although smear microscopy is the most commonly used diagnostic test, it lacks the sensitivity to gain control over the spread of tuberculosis. Consequently new diagnostic methods for smear-negative tuberculosis are being sought. This pilot study analysed the kinetic response of IP-10 over 14 days of chemotherapy in patients with pulmonary tuberculosis. We hypothesized that early cut-off points could be used for diagnostic confirmation in individuals with smear-negative tuberculosis. **Methods** 29 participants were recruited and retrospectively divided into smear-positive culture-positive (n=20), smear-negative culture/geneXpert-positive (n=8) and smear-negative culture/geneXpert-negative (n=1) patient groups. IP-10 was measured in serum before tuberculosis chemotherapy and on days 1, 2, 3, 5, 7 and after initiation of treatment. **Results** IP-10 concentrations decreased over the first 3 days of chemotherapy in patients with smear-positive and smear-negative tuberculosis (Day 0-1 $p=0.04$, Day 0-2 $p<0.0001$, Day 0-3 $p=0.0001$). IP-10 concentrations of smear-positive and smear-negative tuberculosis patients were higher than the smear-negative culture/geneXpert-negative patient over the course of chemotherapy. The IP-10 concentrations of GeneXpert-resistant tuberculosis patients (n=3) increased over the 14 days of treatment. HIV-positive patients had higher IP-10 concentrations than HIV-negative patients ($p> 0.01$ for all days expect day 7). **Conclusion** The decrease in IP-10 concentrations over the first 3 days of therapy indicates that the difference in IP-10 could be used as a treat-to-test strategy to confirm the diagnosis in patients with smear-negative TB. Further studies are encouraged to explore these hypotheses, to include a larger pool of controls, patients with other pathologies and to investigate whether the same patterns are observed among drug resistant patients.

RAPID DETECTION OF TB LINEAGES IN NEPAL USING IS6110 BASED PCR

Kartyk Moganeradj[1], Ibrahim Abubakar[2, 4], Timothy McHugh[3], Pamela Sonnenberg[4], and Catherine Arnold[1]

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[4]*Research Department of Infection and Population Health, University College London, Mortimer Market, off Capper Street, London WC1E 6JB, UK.*
Highly sophisticated molecular methods are readily available for surveillance of drug resistant TB genotypes in the resource rich scientific community but there are still significant gaps for the resource poor countries either due to lack of infrastructure, equipment, reagents or expertise. Thus we sought to develop appropriate and accessible techniques for the identification of TB strains and their lineages for both the outbreak investigation and also the characterisation of different groups or collections of strains. A rapid PCR technique amplifying products corresponding to common IS6110 insertion sites in specific genetic lineages has been developed that could prove beneficial in this scenario.

EVALUATION OF THE SENSITITRE MYCOTB PLATE FOR SUSCEPTIBILITY TESTING OF *Mycobacterium tuberculosis* ISOLATES

P M Claxton, C Doig, M Smith, E Olson and I F Laurenson
Scottish Mycobacteria Reference Laboratory, Department of Microbiology, Royal Infirmary of Edinburgh, Edinburgh EH16 4SA.
Phenotypic drug susceptibility testing (DST) of *Mycobacterium tuberculosis* has traditionally been performed on either solid culture medium by the solid Agar Proportion Method (APM) or Resistance Ratio Method (RRM), or in liquid culture by the radiometric Bactec 460 or Bactec MGIT 960 system. The aim of this study was to evaluate the performance of the MYCOTB MIC plate method and our in-house RRM for DST of 20 proficiency test strains of *M tuberculosis* which form part of the WHO EQA programme for DST. The results were compared to the judicial consensus result from the SRL in Antwerp as the gold standard.

Inoculated MYCOTB plates were read after 14 days incubation and MIC results were interpreted by comparison with the standard APM critical concentration with susceptibility defined as an MIC less than or equal to the critical concentration and resistance as an MIC greater than it. After 4 weeks incubation, RRM was interpreted by calculating the ratio of the MIC of the test strain to the modal MIC of 3 susceptible wild-type control strains. A resistance ratio of 2 or less indicates the strain is susceptible whereas a ratio of 4 or more indicates resistance.

Results for the 7 antimicrobial agents common to the WHO panel and MYCOTB plate showed overall agreement of 94.3%, whereas for the 6 drugs common to the RRM the overall agreement was 90.7%. Agreement between the MYCOTB plate and the judicial result from Antwerp was 100% for 4 drugs (isoniazid, rifampicin, amikacin and ofloxacin), and 85%, 80% and 95% for streptomycin, ethambutol and kanamycin respectively. For the RRM the agreement was 90%, 100%, 90%, 95%, 72.2% and 95% for streptomycin, isoniazid, rifampicin, ethambutol, amikacin and capreomycin respectively.

In conclusion, this study suggests the MYCOTB plate method is a reliable and less labour intensive alternative to the RRM for DST of *M tuberculosis* isolates with results available 2 weeks earlier than with

RRM.

DEMOGRAPHIC AND GEOGRAPHICAL CHARACTERISTICS OF TUBERCULOSIS (TB) IN THE ABORIGINAL POEPLES OF ALBERTA AND SASKATCHEWAN, CANADA

S.J. Patel, C. Heffernan, L.D. Saunders, Z. Gao, and R. Long
8334A Aberhart Centre, 11402-University Avenue, NW, Edmonton, AB T6G 2J3

Introduction

The Aboriginal peoples of Canada represent only 5% of the Canadian-born population but account for >50% of all Canadian-born TB cases. Of these groups, the Registered Indian and Métis peoples in the provinces of Alberta, Saskatchewan and Manitoba (i.e the 'Canadian Prairies') contribute more than one-half of all Aboriginal cases in Canada.

Objective: This study aims to describe the demography and the community of residence of adult (>14 years) Registered Indian and the Métis peoples diagnosed with culture-positive pulmonary TB (PTB) and their contacts who were tuberculin Skin Test (TST) converters in Alberta and Saskatchewan in 2007 and 2008. Transmission events of these cases were defined as tuberculin skin test (TST) converters that were or were not secondary cases.

Methods The transmission events were identified using conventional (contact tracing) and molecular (genotyping of *Mycobacterium tuberculosis* isolates with 24 loci-Mycobacterium Interspersed Repetitive Units) methods. A descriptive study was undertaken to characterize all transmission events by age, gender, population group, and community type. TB transmission networks in Alberta and Saskatchewan was visually described using a quasi-social network analysis

Results A total of 104 Aboriginal PTB cases were diagnosed in the study period; 73 (70%) Registered Indian and 31 (30%) Métis. Their mean age was 38.2 years(SD =16.7); 50(48%) were male; and 56(54%), 24 (23%), and 24(23%) resided in reserve communities, Métis settlements, and metropolitan areas, respectively. Of the 104 PTB cases, 48 had 464 and no converters and 56 (38 Registered Indian; 18 Métis) had 1729 contacts and 187 converters. Of all converters, 51 (27.3%) were secondary cases. The mean age of secondary cases was 20.6 years (SD= 18.1); 29 (57%) were male; and 32 (62.7%), 11 (21.6%), 8(15.7%) were situated in reserve communities, Métis settlements and metropolitan areas, respectively. Transmission to a non-Aboriginal group was rare and had occurred in 3% of all events. The proportion of reported young contacts (<15 years) was significantly greater in Saskatchewan with 58% rate of transmission in this group compared to 27% in Alberta. According to transmission network analysis, 36 (64.3%) of all transmitting Aboriginal cases in Alberta and Saskatchewan was linked to another case by at least one mutual contact. In 20 (35.7%) of the cases, transmission occurred in isolation and was not linked to another case.

Conclusion TB transmission in Alberta and Saskatchewan is reported in over half of the Aboriginal PTB cases. TST converters that were secondary cases were largely confined to the community of residence of the potential source case. The high rate of transmission in Saskatchewan youth and the role of mutual contacts of PTB cases suggest the need to prioritize contact tracing to target these groups in order to reduce TB transmission in the Prairies.

DEMOGRAPHIC AND GEOGRAPHICAL CHARACTERISTICS OF TUBERCULOSIS (TB) TRANSMISSION IN THE ABORIGINAL PEOPLES OF ALBERTA AND SASKATCHEWAN, CANADA

S.J. Patel, C. Heffernan, L.D. Saunders, Z. Gao, and R. Long

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