TB screening in a Dialysis Unit: detecting latent TB infection is only half the problem
History

- May 2012
- 56 year man old from India (via Dubai)
- UK since April 2011

Background
- ESRF requiring haemodialysis
- Secondary to SLE
- Significant CCF
History and examination

- Presenting complaint
  - Weight loss of 20kg over 6 months
  - Productive cough
  - Breathlessness
  - No night sweats

- Examination
  - Temperature 38.9°C
  - Respiratory crackles
  - Nil else

- Persistently raised ESR and CRP
Investigations

- MRSA screens
- Blood cultures
- Sputum mc&s
- CXR
- Transthoracic echo
Course

- Given IV co-amoxiclav for “sepsis cause”
  - CXR signs

- Doesn’t really improve despite this
Course

- 6 days into admission
  - All microbiology negative
  - Echo report: ejection fraction 22%
  - HRCT: bilateral upper lobe cavitating lesions

- Respiratory opinion

- Consider TB
  - 3 sputum samples for AFBs
  - Move to a side room
Therefore

- Smear positive
- GenXpert (Cepheid)
  - PCR positive
  - RpoB negative
- Therefore *likely* to have fully susceptible TB
- Positive IGRA (QuantiFERON-TB Gold) as well in the past
Implications

- 57% side room rates in PCH
- Open 4-bedded bay for 6 days
- Dialysis since arrival in UK for 13 months
Haemodialysis in Peterborough

- Complicated

- PCH is a satellite unit of University Hospitals Leicester NHS Trust

- Corby is used by Peterborough patients when we’re full

- Leicester and Corby are in East Midlands HPU
Outbreak meeting

- PCH
- DIPC
- ICD
- Infection control nurses
- Respiratory physician
- Renal physician
- Matron for the dialysis unit
- Risk managers
- Communications
- Occupational health etc

- Leicester
- DIPC (medical microbiologist)

- HPA
- EoE and EM
Outbreak meeting

- Who do we contact-trace?
  - When did he become symptomatic?

- How do we contact trace?
Outbreak meeting

- When did he become symptomatic?
  - In-patient episode

- How far back do you go for the dialysis unit(s)?

- Ask the clinicians
  - 4 respiratory physicians in Peterborough
    - One had seen the patient
  - 3 renal physicians
    - Two had seen the patient
Outbreak meeting

- **Respiratory clinic**
- September 2011 (within 6 months of arrival into UK)
  - Abnormal CXR and weight loss
  - Positive IGRA test
  - TB excluded clinically
    - Symptoms thought to be due to SLE, ESRF and CCF
    - Weight loss reflected improving fluid balance and / or cardiac cachexia
    - CT chest normal
- Reviewed January 2012
  - Clinically improving and gaining weight
- **HD in PCH**
  - Corby prior to September 2011
  - PCH since September 2011
Who to screen

- Letter to 6 exposed patients (>8 hours) and their GP in bay (NICE guidelines)
- Letter to exposed staff (ward and HD unit) and Occupational Health (NICE guidelines)
- Household contacts
  - Wife, mother-in-law, 2 young children (with BCG)
  - One older child offered ATT
  - Eldest child failed to attend OPD clinic
Who to screen

- HD on 3x per week
  - 4-5 hours per episode
  - All patients who had dialysed with him in the “afternoon” shift since September 2011 (i.e. PCH)
How to screen

- **CXR**
  - If “abnormal” consider CT chest

- **Tuberculin skin testing (TST) considered**
  - Used previously

- **IGRA used**
  - Better than TST
  - No differences between kits
  - (several meta-analyses)
“Afternoon” shift

- Results
- 16 patients
- 2 died before follow-up
- 1 patient transplanted

- 2 had reactive IGRAs (level >0.35iu/ml)
  - One Caucasian
  - One Indian
- 2 had abnormal CXRs
Morning and evening shifts

- Therefore extend screening morning and evening shifts as well

- Morning and evening shifts
  - Significant cross-over between shifts
  - Outpatient clinics are held in the unit on non-HD days

- 9 of 41 (22%) identified with latent TB (LTBI) after screening and offered ATT for LTBI
  - 4 (44%) completed therapy (joint pains, nausea, itching, malaise)
6 months

- Repeat IGRA and CXR (or CT) in November at 6 months on the 27 patients with negative IGRA tests

- A further 3 positive
  - 2 Caucasian born in UK
  - 1 Asian born in Pakistan
12 months

- All patients retested
- 7 of 9 positive initially were retested
- 4 negative
- 3 remained positive (red line)
  - Level >1.5 iunits / ml
- No new cases
  - Clinically
  - On IGRA testing
- Stop testing
Clinical course of the source patient

- Eventually grew fully susceptible TB from the index case
  - Culture ultimately positive on d14
  - Confirmed as *M. tuberculosis* d38
  - Fully susceptible TB confirmed at d81

- He stopped his treatment at 6 months
  - Clinically improved
  - CXR normal
  - Weight gained
Evidence-based guidelines for dealing with patients with suspected TB in dialysis units

Guidelines for the prevention and management of Mycobacterium tuberculosis infection and disease in adult patients with chronic kidney disease

Prepared by members of the Guideline Group on behalf of the British Thoracic Society Standards of Care Committee and Joint Tuberculosis Committee, Heather Milburn, Neil Ashman, Peter Davies, Sarah Doffman, Francis Drobniewski, Saye Khoo, Peter Ormerod, Marlies Ostermann, Catherine Snelson

ABSTRACT
Guidelines have been compiled by the Joint Tuberculosis Committee of the British Thoracic Society for the prevention and management of Mycobacterium tuberculosis infection and disease in patients with all grades of renal impairment.

Patients with renal disease are at increased risk of tuberculosis (TB). This is true for all patients with chronic kidney disease (CKD), but particularly so for those from ethnic minority groups who are both at increased risk of developing active TB disease and in whom the prevalence of CKD is also substantially higher. Despite this increased risk, there are few guidelines for the investigation and treatment of TB disease in CKD. Although there is broad agreement over drug treatment and its duration, there are differing views regarding dosing. There are no randomised controlled trials into outcomes in patients with advanced CKD, and little information specifi-
Implications

- 91 IGRA tests were performed
- 103 chest radiographs
- 3 CT chests
  - all of which had to be reviewed and interpreted
- 11 courses of LTBI therapy were administered
  - 4 completed
- 32 *extra* out-patient consultations were required
Lessons

- TB PCR very useful
  - Smear positive d1
  - PCR positive d2
  - Culture d38

- Multidisciplinary effort essential
  - All stakeholders involved

- IGRA better than TST
  - (Meta-analyses)
  - Level >1.5 useful rather than 0.35 more indicative; nothing in the literature
  - Serial testing useful despite NICE guidelines which don’t support this

- Low compliance with therapy for LTBI

- Lots of work with no obvious transmission
  - Can you afford *not* to do it?
Exclusive: patient deaths spark tuberculosis investigation

12 OCTOBER, 2012 | BY SHAUN LINTERN

Thirteen hospital staff test positive for tuberculosis

7 NOVEMBER, 2012 | BY SHAUN LINTERN

Thirteen staff working at a dialysis unit at the centre of a tuberculosis outbreak have tested positive for the infection, HSJ has learned.
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