endemic rates of TB are we under using investigations to gain tissues samples in suspected cases?

Method We undertook a retrospective analysis of 46 cases coded as abdominal tuberculosis from our local hospital register. Data was collected from case notes and computer systems regarding pathology and radiology results.

Results The majority of patients were born in the Indian subcontinent: India 39%, Pakistan 20% and Bangladesh 8%. More than half the patients had lived in the UK for less than 5 years. 54% of patients had symptoms for 1–4 months before presentation. None of the cases had TB in the past and 13% could recall possible TB contact.

67% of CXR was normal, and of those who had abnormal films, only 4 cases had features that were specific for TB. Focused imaging taken included: CT abdomen 77%, US abdomen 18%, MR abdomen 1%, Barium follow through 5%.

48% of patients had procedures to obtain histological and microbiological results, including laparoscopy, laparotomy, colonoscopy, gastroscopy or ascitic tap. 26% of patients underwent laparoscopy. Of the remaining patients, 18% obtained microbiological samples from alternative sites. Thus, 42% patients were treated on clinical symptoms and radiological image findings alone.

Discussion Laparoscopy has been regarded as the gold standard and diagnostic investigation of choice in the management of abdominal TB[1, 2]. In our cohort 26% underwent laparoscopy. The reason for this unclear but could be due perceived risk with the procedure, lack of availability of service or in many cases is used as a last resort. In TB endemic areas, we suggest the development of an acceptable evidence based investigational pathway incorporating our surgical and gastrointestinal colleagues leading to more prompt and through management of abdominal tuberculosis.

REFERENCES

1. McLaughlin S, Jones T, Pitcher M, Evans P. Laparoscopic diagnosis of abdominal tuberculosis. *Aust NZ J Surg* 1998;68: 599–601
2. Rai S, Thomas W M. Diagnosis of abdominal tuberculosis: the importance of laparoscopy. *J R Soc Med*. 2003 December; 96(12): 586–588.

P31 ASSESSING THE EFFECTIVENESS OF TUBERCULOSIS (TB) SCREENING IN NEW ENTRANT HEALTHCARE WORKERS USING DIFFERENT TIME CUT-OFFS TO DEFINE HIGH RISK INDIVIDUALS

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10.1136/thoraxjnl-2013-204457.181

Introduction and Objectives NICE (2011) and the Department of Health (2007) provide guidance for occupational health departments for TB clearance in healthcare workers. Previous work from the London Consortium of Occupational Health Providers (LCOHPS) shows a marked variation in practice, notably in the criteria for defining high risk individuals. The length of time in the UK for an individual from a high TB endemic area (defined as an incidence of 40 per 100,000 or greater) to be considered as low risk ranges from 6 months to >5 years. We performed a retrospective study of new trust employees to see if changing the definition of a high risk individual would impact on the effectiveness of our screening programme.

Methods We performed a retrospective study of 40 new employees at our trust between 2008 and 2012. Cases were selected on the basis of a positive QuantiFERON-TB Gold test at occupational health screening. Demographic data, including date of UK entry, were collected and analysed.

Results Results are summarised in Table 1.

Conclusions Changing the definition of a high risk individual by reducing the cut-off time since entry to the UK may have both financial and time-saving consequences. However, our data show that a significant proportion of healthcare workers with latent TB infection, and in some cases active TB infection, would be missed by reducing the cut-off to 1 year. Screening of healthcare workers is an important aspect in the prevention and control of TB. Reducing the effectiveness of this screening exposes patients to increased risk. In view of these data, we would not recommend reducing the cut-off time for the definition of a high risk individual to less than 5 years.

Abstract P31 Table 1. Results

Time since entry to the UK (years)	Number of individuals (%)	Treatment received	
		Latent prophylaxis	Active TB treatment
<1	11 (27%)	11	0
1–5	22 (55%)	18	2
>5	7 (18%)	6	1

P32 WHEN A TEST IS NEITHER POSITIVE NOR NEGATIVE: THE IMPACT OF EQUIVOCAL AND INDETERMINATE QUANTIFERON TB IGRA IN A UK POPULATION

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10.1136/thoraxjnl-2013-204457.182

Introduction For the diagnosis of latent tuberculosis (LTBI), clinicians like interferon-gamma based assays (IGRA) to be either positive or negative. Tests can be indeterminate (failure of the positive or negative control); and recently an equivocal category has been introduced for QuantiFERON IGRA results that lie around the positive cut off, 0.35 IU/mL, covering the range 0.2–0.7 IU/mL. Within our hospital, it is recommended that indeterminate or equivocal results are initially repeated by the requesting clinician. We report our outcomes from March 2010, when the equivocal category was introduced.

Methods Hospital pathology and clinical records were data-mined. Cost analysis used local NHS costs.

Results Tests for 1964 individuals were processed (over one-third from Occupational Health, and another one-third pre-biological therapy). 92% of subjects had a definitive first result, with 6% (116) equivocal and 2% (42) indeterminate (Table 1). 60% of equivocal tests were below the positive cut off of 0.35. The demographics of those with an equivocal result were broadly comparable with the whole tested population.

Almost half of the **equivocal** tests were not repeated (Table 1). 45% of repeats were negative and one-third still equivocal. 12 of 34 subjects referred to the TB service were treated for LTBI–10 with a positive IGRA on re-testing. One other patient with an initial equivocal test developed active TB during follow up.

43% of people with an **indeterminate** result had no repeat test (Table 1). 1 of 6 subjects referred to the TB service following an indeterminate IGRA received LTBI treatment.

Cost-analysis indicated that equivocal and indeterminate results plus subsequent TB service management increased the cost of each initial QuantiFERON diagnostic test from £35 to £40.76 per patient.

Conclusion 8% of subjects had an equivocal or indeterminate first IGRA result. The recommended subsequent action often was not followed by the requesting clinicians. When repeated, the test provided a definitive result in two-thirds of subjects - the majority being negative. This adds an appreciable cost to the test, and brings it in line with other commercial IGRA. Further education of referring clinicians is required to minimise avoidable waste and optimise patient care.

Abstract P32 Table 1. Equivocal and Indeterminate repeated tests and referrals

	Equivocal [n = 116, %]	Indeterminate [n = 42, %]
Tests repeated	66 (57%)	24 (57%)
Positive on repeat	13 (20%)	3 (12%)
Negative on repeat	30 (45%)	15 (63%)
Equivocal/indeterminate on repeat	23 (35%)	6 (25%)
No. of patients referred to TB clinic	34	6
No. of patients treated for LTBI	12	1

Abstract P33 Table 1.

Patient No.	Mask Timing	Sputum (Sp)/ BAL samples (Ba) Smear	Culture	GeneXpert	Other Sample Smear	Culture	Mask
2	Pre-treatment	Sp Positive	Positive	Positive	N/A	N/A	Positive
3	Pre-treatment	Sp Positive	Negative	Negative	N/A	N/A	Positive
4	Pre-treatment	Sp Negative	Negative	N/A	N/A	Neck Pus Positive	Negative
6	Pre-treatment	Sp Positive	Positive	Positive	N/A	N/A	Positive
5	Pre-treatment Post BAL	Ba Positive	Positive	N/A	N/A	N/A	Negative
7	Pre-treatment Post BAL	Ba Positive	Positive	N/A	N/A	N/A	Negative
1	Day 5 of treatment	Sp Negative	Negative	N/A	N/A	Pleural fluid Positive	Negative
9	Day 5 of treatment	Sp Positive	Positive	N/A	N/A	N/A	Positive
8	Negative Control	Sp Negative	Negative	N/A	N/A	N/A	Negative
10	Negative Control	Sp Negative	N/A	Negative	N/A	N/A	Negative

P33 MASK SAMPLING IN PULMONARY TUBERCULOSIS

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10.1136/thoraxjnl-2013-204457.183

Introduction and Objectives Although pulmonary tuberculosis (pTB) remains a major health burden worldwide relatively little is known about the formation of droplets and aerosols by these patients by that are considered to be the primary source of transmission. We have developed an approach based on wearing face masks.

Our aim was to capture expectorated droplets and aerosols from patients with pTB in a convenient continuously wearable system and to quantify the retained *Mycobacterium tuberculosis* (Mtb).

Methods We designed a mask sampling system to be worn for one hour. A filter mounted in the mask was subjected to GeneXpert analysis (DNA based detection of Mtb and rifampicin resistance) and 16S rRNA analysis using in-house techniques. Where available, a concurrent sputum sample was also processed.

Results Table 1 shows results from 10 patients including two negative controls and one extra-pulmonary TB case.

Three of five pre-treatment pTB patients and one of two pTB patients at day 5 of treatment were filter GeneXpert positive. No Mtb was detected from our negative controls. In one case (patient 3) the mask was the only positive sample apart from a scanty smear. In background experiments we demonstrated a detection limit of 1200 CFU/filter. Preliminary studies on RNA analysis suggest that this may have advantages over DNA-based detection but these require confirmation.

Conclusions The mask sampling system detected expectorated Mtb in just over half of the patients diagnosed to have pTB and all four of those that were sputum smear positive. Compatibility with the GeneXpert system makes the approach widely applicable.

Further studies will be required before comparisons with the Cough Aerosol Sampling System and Guinea Pig sampling approach can be made. However, the mask sampling appears at least as sensitive as the former and the convenience and cost of the method recommend its potential for both diagnosis and research into TB transmission.

Pulmonary rehabilitation

P34 THE MINIMAL CLINICALLY IMPORTANT DIFFERENCE OF THE COPD ASSESSMENT TEST

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10.1136/thoraxjnl-2013-204457.184

Background The COPD (chronic obstructive pulmonary disease) assessment test (CAT) is a simple 8-item, health status instrument (Jones PW *et al* 2009). It has good psychometric properties and has been shown to be responsive to pulmonary rehabilitation (PR) (Dodd *et al* 2011) and recovery from exacerbation (Jones PW *et al* 2011). The CAT has also recently been incorporated into the Global Initiative for Chronic Obstructive Lung Disease (GOLD) combined assessment of COPD, to help assess disease severity. However the minimal clinically important difference (MCID) for the CAT has not been formally established.

Aims The aims of this study were to assess the relationship between change in CAT and change in other health related quality of life (HRQoL) questionnaires and to provide estimates for the MCID.

Methods The CAT, St. George's Respiratory Questionnaire (SGRQ), Chronic Respiratory Questionnaire (CRQ) and Clinical COPD Questionnaire (CCQ) were measured in 565 COPD patients before and after outpatient PR. Paired t tests were used to compare outcomes before and after PR. Spearman rank correlation was used to compare changes in CAT with other HRQoL questionnaires. Using an anchor-based approach and receiver operating characteristic (ROC) curves, the CAT change cut-offs that identified patients achieving the known MCID for other health status questionnaires with PR were identified.

Results The CAT, SGRQ, CRQ and CCQ all significantly improved with PR. CAT change correlated significantly with change in SGRQ, CRQ and CCQ (r = 0.30, -0.44, 0.52