tarnished by a high complication rate and is not suitable in patients with significant co-morbidity. Therefore, VBN and R-EBUS are particularly useful where TTNB carries a high risk.

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S33 PERFORMANCE OF EBUS-TBNA IN THE PATHOLOGICAL SUBTYPING AND MOLECULAR TESTING OF NON-SMALL CELL LUNG CANCER (NSCLC) IN A UK THORACIC ONCOLOGY CENTRE

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Introduction The categorisation of NSCLC into squamous and non-squamous subtypes is an important requirement for the optimisation of patient care as this may modify chemotherapy regimens and direct molecular testing. The lung cancer national audit highlights the need to minimise the rate of NSCLC not otherwise specified (NSCLC-NOS).[1] The aim of our study was to determine whether samples obtained by endobronchial ultrasound guided-transbronchial needle aspiration (EBUS-TBNA) could be used to pathologically subtype NSCLC and provide sufficient material for molecular testing.
Methods A prospectively maintained database of consecutive patients with suspected lung cancer referred to our unit, a UK regional thoracic oncology centre, was analysed. All patients diagnosed with NSCLC by EBUS-TBNA cytology at our centre between Sept 2013 and Sept 2014 were included in the study.
Results A total of 89 patients were diagnosed with NSCLC using EBUS-TBNA. The pathological subtypes were: n = 46 (51.7%) squamous cell carcinoma, n = 41 (46%) adenocarcinoma and n = 2 (2.2%) NSCLC-NOS. All samples with a new diagnosis of non-squamous subtype were sent for EGFR mutation analysis, with sufficient material in 97% (n = 35/36) and one activating mutation was identified. ALK analysis was successfully performed in all 5 samples in which this was requested. Additional molecular testing was requested in 9 samples with sufficient material in 89% (n = 8/9).
Conclusions EBUS-TBNA cytology can be used to successfully subtype NSCLC and provide adequate material for molecular testing in the majority of cases. The rate of NSCLC-NOS in our study (2.2%) compares favourably with local cancer network (13.5%) and national (12.9%) figures.

REFERENCE

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S34 DO BRONCHIAL WASHINGS IMPROVE THE DIAGNOSTIC SENSITIVITY FOR LUNG CANCER WHEN ENDOBRONCHIAL TUMOUR IS SEEN?

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Background/introduction Current BTS guidelines suggest that when endobronchial tumour is seen optimal diagnostic sensitivity is achieved when at least five mucosal biopsies are supplemented with bronchial washings and brushings.

We review our bronchoscopy practice annually in line with current guidance, and strive to make continuous improvements. We have previously noted that bronchial brushings improve the diagnostic sensitivity for lung cancer when an endobronchial tumour is seen, but bronchial washing samples do not.
Aims To confirm that bronchial washings do not increase diagnostic sensitivity for lung cancer where endobronchial tumour is seen at flexible bronchoscopy.
Method We reviewed all flexible bronchoscopy procedures performed at our hospital during a two-year period (n = 365). We reviewed the Electronic Patient records for histology and cytology results in all cases where endobronchial tumour was visualised.
Results Mucosal biopsies and either bronchial brushings or bronchial washings or brushings and washings were performed in all cases where an endobronchial lesion was seen (n = 65). Washings were performed in addition to mucosal biopsies in 95% of cases, bronchial brushings however were sent in 78% of cases.

The diagnostic sensitivity for mucosal biopsies alone was 80% (n = 65), bronchial brushings in addition to mucosal biopsies improved diagnostic sensitivity to 86%. In the small number of cases (n = 4) mucosal biopsies were negative for malignancy but a malignant diagnosis made on bronchial brushings and washings, bronchial brushings were positive in all cases and whereas bronchial washings were positive in only 50%.
Conclusion Bronchial washings did not add any additional value to the diagnosis of lung cancer when endobronchial tumour was seen. We suggest that mucosal biopsies and brushings combined provide optimal diagnostic sensitivity in these cases. Omitting bronchial washing would produce both cost saving (in our Trust processing bronchial washings costs £76.50 per sample), and time efficiencies; bronchoscopists could then focus on obtaining multiple good quality mucosal biopsies, which are of paramount importance in molecular subtyping of lung cancers.

S35 METHYLENE BLUE STAINING DIFFERENTIATES NON-SMALL CELL LUNG CANCER TISSUE

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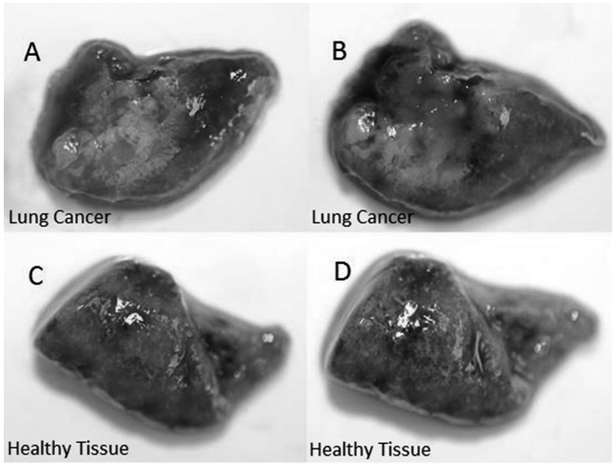
Introduction The early detection of lung cancer during bronchoscopy remains a diagnostic challenge. Chromobronchoscopy, using vital dyes, has the potential to aid diagnosis by highlighting areas of dysplastic or malignant change. There are limited numbers of studies in this field but results to date are conflicting. Using a novel electrospray system, we delivered targeted methylene blue (MB) to *ex vivo* human lung cancer tissue. The aim of this study was to identify whether MB provided a differential stain for lung cancer.
Methods Patients undergoing surgical resection were consented to the study. Following lobectomy, fresh sections of cancerous and non-cancerous tissue were obtained. A range of concentrations of MB were applied topically to tissue sections by electrospray atomisation. Following delivery of MB, the tissue was washed with 0.9% saline and images captured. Results were classified in terms of intensity of dye uptake as well as differential staining between normal and cancerous tissue.

Results 11 patients were included in this study. NSCLC was confirmed in all patients. 7 patients were diagnosed with adenocarcinoma and 4 patients with squamous cell carcinoma. A differential stain for lung cancer versus normal tissue was achieved (Figure 1).



Abstract S35 Figure 1 Lung cancer (a) and healthy tissue (c) prior to MB delivery. Differential staining of lung cancer tissue (b) following MB delivery and wash. Minimal staining of healthy tissue (d) following MB delivery and wash

Conclusion These findings indicate that MB has the potential to differentiate malignant and healthy tissue in an *ex vivo* model. This study supports the utility of MB as a potential diagnostic aid in lung cancer surveillance.

Management of TB

S36 WEEKLY AUDIOGRAMS PRE-EMPTIVELY IDENTIFY AMIKACIN RELATED OTOTOXICITY IN MDR-TB

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10.1136/thoraxjnl-2015-207770.42

Introduction and objectives Updated WHO guidance recommends at least 8 months of aminoglycoside (AG) for MDR-TB but provides no definitions or monitoring strategies for otoxocity. Most UK centres perform 2–4 weekly audiograms; we perform weekly audiograms. We retrospectively investigated whether this strategy pre-emptively identifies ototoxicity before significant hearing loss (HL) is evident.
Methods Patients we treated with amikacin for MDR-TB from 2002–2015, with at ≥4 weekly pure tone audiograms, were included. Audiograms, treatment duration, symptoms, creatinine clearance and outcome were obtained from clinical records. All patients received amikacin at 15 mg/kg per day and had weekly amikacin levels and renal function. Definition of HL was defined as per the ASHA as >20 dB loss of pure tone threshold from baseline at one frequency or >10 dB at two adjacent frequencies.
Results 31 MDR-TB patients fulfilled selection criteria; 15 female, median age 36 years (IQR: 24–43) and median weight 61.5 kg (IQR: 52–65.) 22/31 (70.9%) patients had their first audiogram within 10 days; median 5.5 (IQR:4–7.) The median duration of amikacin treatment was 79.5 days (IQR: 61.75–94) and median total dose of 70.8 g (IQR:44.4–97.75.) 4/31 (12.9%) had moderate-severe baseline hearing loss (HL). A total of 17 (54.8%) patients met the ASHA definition of HL: 7 at 4 kHz, 10 at 6 kHz and 17 at 8 kHZ. The median time to meeting ASHA definition of HL among these patients was 59 days (IQR: 41–84.75). 16/31 (51.6%) patients stopped amikacin earlier than planned and 1 continued; 2 (6.5%) due to symptoms of deafness, 2 (6.5%) due to tinnitus and 12 (38.7%) due to asymptomatic high frequency HL on audiograms. Creatinine clearance and trough amikacin levels remained within range for all patients. Regarding outcomes, 17 (54.8%) completed TB treatment, 5 (16.1%) remain on treatment, 4 (12.9%) transferred, 3 (9.7%) were lost to follow up and 1 (3.2%) died.
Conclusions AGs are important in the treatment strategy of MDR-TB but this must be balanced with the long-term side effects. The ototoxicity of AG is unrelated to elevated drug levels or contributing factors and is a common adverse effect. Weekly audiograms led to earlier detection of pre-symptomatic amikacin ototoxicity and cessation in 38.7% of patients.

S37 THE RESPONSE OF OBJECTIVELY-MEASURED COUGH TO TREATMENT IN TUBERCULOSIS: AN EXPLORATORY STUDY

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Introduction and objective Cough is predominant in pulmonary tuberculosis and transmits infection, yet it is unclear how rapidly it responds to treatment. We explored changes in objectively-measured cough frequency during TB therapy with respect to other markers of disease.
Method Before or on commencing anti-tuberculous treatment, consecutive patients with pulmonary tuberculosis wore the Leicester Cough Monitor for 24 h, a device comprising a small digital audio recorder and microphone with software for cough detection. Those with a baseline cough frequency greater than the upper limit of normal (*c.* 100 coughs/24 h [c/24h]) were asked to undergo repeat monitoring during initial hospitalisation (if applicable), and later to coincide with routine clinic attendance or directly observed therapy (DOT).
Results Median baseline cough frequency was 203 (IQR 75–470) c/24 h in all participants (n = 44), and >100 c/24 h in 32 (73%). 22 patients were willing and available to undergo serial cough monitoring (12 current smokers, 18 sputum smear positive disease [12 also with visible lung cavities], and one with HIV). Three had isoniazid-resistant disease; the remainder were fully drug-sensitive. All were eventually treated successfully. None had other respiratory diagnoses.

Cough frequency in the majority declined consistently during therapy with substantial improvements by one week (Figure 1). At 2 and/or 8 weeks, five patients had a higher cough frequency than at baseline. Amongst these slow responders there was initial extensive radiographic change (n = 1), poor drug adherence with ongoing weight loss (n = 1), a paradoxical reaction to treatment with the development of a paraspinal abscess (n = 1), and, in the patient with HIV, persistent sputum smear positivity at 8 weeks with minimal radiographic improvement despite DOT and normal plasma rifampicin levels. One other patient