(DILI) following anti-TB therapy. No such analysis has been performed in the UK.

Aims To assess

1. The prevalence of markers of HBV and HCV infection in patients undergoing anti-TB therapy.
2. Whether serological evidence of HBV/HCV increases risk of DILI.

Method A prospective study on 429 TB patients receiving anti-TB therapy in a diverse urban TB clinic. Serological markers of HBV/HCV/HIV infection were documented. ALT was measured prior to treatment and 2–4 weeks after treatment initiation. DILI was defined as an ALT rise of greater than 2-times upper limit of normal following a normal pre-treatment level (<40 IU/ml).

Results 58.7% of patients were from either South-East Asia or Africa. 61 (14.2%) patients were isolated anti-HBc antibody positive (Anti-HBc), 11 (2.6%) were Hepatitis B surface antigen positive (HBsAg) and 7 (1.6%) were HCV antibody positive. The prevalence of active HBV/HCV infection was significantly higher than the estimated UK prevalence in this urban TB clinic. Three (5.3%) patients with serological evidence of HBV/HCV had DILI compared to 25 (9.5%) of those without.

Conclusion HBV/HCV prevalence is higher among TB patients and routine screening for viral hepatitis should be considered in this group. DILI was not increased in patients with serological markers of HBV/HCV.

P64 THE EFFECT OF WOOD SMOKE ON THE ABILITY OF HUMAN MACROPHAGES TO PHAGOCYTOSE AND KILL MYCOBACTERIUM TUBERCULOSIS

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Introduction Half of the world's population are exposed to household air pollution from biomass fuels, which are increasingly recognised as a global risk factor for impaired respiratory health. Data from case-control studies has associated Tuberculosis (TB) with biomass fuel exposure. We hypothesised that particulate matter (PM) within alveolar macrophages of individuals exposed to biomass smoke detrimentally affects macrophage function by: (A) Reduced phagocytosis of TB, leading to increased infectivity and (B) Impaired macrophage killing of TB, leading to increased susceptibility to disease. This study assessed the ability of wood smoke exposed human monocyte-derived macrophages (MDMs) to phagocytose and kill TB in vitro.

Methods MDMs, from buffy coats, were cultured in vitro for 12 days and then exposed to suspensions of wood smoke PM (Malawian (MW) and Norwegian (NW) wood, 10 μ g/ml or 50 μ g/ml) for 8 h. The PM loaded cells were then challenged with TB. Phagocytosis was assessed by manually counting infected macrophages, using fluorescent microscopy and by quantitative culture of day 1 supernatant and macrophage lysate. Remaining cells were maintained in culture for 7 days before lysis and quantitative culture to assess intracellular growth.

Results Microscopy data showed a reduced proportion of infected macrophages in the high dose NW smoke group (Abstract P64 figure 1A), and fewer TB bacilli per macrophage in the two MW smoke groups (Abstract P64 figure 1B). Quantitative culture of day 1 supernatant and cell lysate showed no difference between the groups (Abstract P64 figure 1C). Quantitative culture of day 7 lysate showed reduced *Mycobacteria* loads in the high dose NW smoke group (Abstract P64 figure 1D).

Abstract P64 Figure 1 The effect of wood smoke on monocyte-derived macrophages to phagocytose and kill *Mycobacterium tuberculosis*: (A) Effects of wood smoke on macrophage phagocytosis of TB (assessed by microscopy). (B) Mean numbers of bacilli per infected macrophage. (C) Mean time to positivity for culture of day 1 supernatants. (D) Calculated *Mycobacterial* load of day 7 lysates (log scale).

Discussion We have developed an in vitro model to assess the interaction between TB and wood smoke exposed macrophages. Phagocytic data does not fully support increased TB infectivity in biomass smoke exposed individuals. Quantitative culture data does not demonstrate a difference in the ability of wood smoke exposed MDMs to kill TB; high dose NW smoke led to a reduced intramacrophage growth of TB probably as a result of the toxic effect of PM on *Mycobacteria* growth. Modifications of this model are required to provide mechanistic evidence of an association of TB with wood smoke exposure.

P65 TREATING TUBERCULOSIS IN RURAL SOUTH AFRICA

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Methods All the patients admitted to the male and female Tuberculosis wards at a rural hospital in KwaZulu-Natal, South Africa, during a 1-month period were entered into a database. Basic demographic data were collected as well as information about HIV status, medications, complications and 1-month mortality. The area's tuberculosis (TB) incidence is 1046 per 100 000 and there is an HIV infection rate of 29%.

Results 70 patients were admitted during the time allocated. 89% were HIV positive. The mean CD4 count of the HIV positive patients was 114, however only 45% of patients were on ARVs at time of admission. 21% of patients had extrapulmonary TB. Only 17% were AFB positive, a further 9% had culture results back, two patients cultured proven multidrug resistant TB. Two patients had a history of completed XDR TB treatment. 10% patients developed drug induced hepatitis, 3% had pneumothoraces, 10% had co-existent renal impairment, 11% had neurological complications. There was a 23% 1-month mortality. No patients who were HIV negative died. 27% died of respiratory failure, 12% had hepatic failure, likely secondary to antituberculous medication.

Discussion The mortality rate among this population of patients with tuberculosis far exceeds that in the UK. Sadly a lack of resources, HIV coinfection and high rate of drug resistance (10% MDR rate) conspire to make TB a challenging disease to treat in this area of South Africa.

Respiratory critical care

P66 INTER-OBSERVER RELIABILITY OF ULTRASOUND TO MEASURE RECTUS FEMORIS CROSS-SECTIONAL AREA IN CRITICALLY ILL PATIENTS

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Introduction Ultrasound is a relatively simple, non-invasive, non-irradiating effort-independent tool to measure quadriceps rectus femoris cross-sectional area (RF_{CSA}) in critically ill patients. We investigated the inter-observer reliability of the technique to validate its clinical utility in this group of patients.

Methods Critically ill patients either in, or within 48 h discharge from, the Intensive Care Unit (ICU) underwent measurement of RF_{CSA} using real-time B-mode ultrasonography using an 8MHz 5.6 cm linear transducer (PLM805, Toshiba Medical Systems Ltd, Crawley, UK) at a distance three-fifths from the anterior superior iliac spine to the superior patellar border. Where complete visualisation of RF_{CSA} was not possible at this point, a more distal point of 2/3 of this distance was used. Ultrasound measurements were performed in turn by two critical care clinicians trained in ultrasound in a random order. The average of three consecutive measurements within 10% was taken as RF_{CSA} for each patient. Both clinicians were blinded to the results of the other.

Results 24 patients had RF_{CSA} measurements performed using ultrasound (M:F 14:10; mean age 55.3±20.1 years). Inter-observer reliability was assessed by considering the level of agreement between RF_{CSA} measurements for each patient between the two clinicians using intra-class correlation coefficients (ICC) adopting a two-way, random effects model for absolute agreement. An ICC of 0.99 (95% CI 0.97 to 0.99) was observed. Abstract P66 Figure 1 shows RF_{CSA} images from both clinicians for one patient.

Abstract P66 Figure 1 Ultrasound images from each clinician for one patient; RF_{CSA} outlined in blue.

Conclusion These data demonstrate high levels of inter-observer reliability between two trained critical care clinicians using ultrasound as a measurement technique for RF_{CSA} in critically ill patients. RF_{CSA} can be used as a novel, reproducible technique to track the trajectory of muscle loss in critically ill patients.

P67 CLINICAL PREDICTIVE VALUE OF THE MEDICAL RESEARCH COUNCIL SUMSCORE IN CRITICALLY ILL PATIENTS

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Introduction Manual muscle testing, in the form of the Medical Research Council sumscore (MRC-SS) is a widely accepted clinical tool for diagnosing intensive care unit-acquired weakness (ICU-AW). Although MRC-SS is a simple bedside test, the nature of the test is volitional limiting its ability to distinguish poor motivation and impaired cognition from actual loss of muscle function. The clinical predictive value of the MRC-SS therefore needs to be assessed.

Method Unselected adult ICU patients (=18 years) ventilated for ≥48 h were eligible. The conscious level of the patients was determined using the Richmond Agitation Sedation Scale; a score -1 to +1 was indicative of awakening. Testing comprised of a two-stage process. *Stage 1:* Patients at awakening were required to follow 4 simple, one-stage commands. *Stage 2:* If all 4 one-stage commands were successfully completed, MRC-SS testing was performed by a specialist ICU rehabilitation clinician. ICU-AW was defined as MRC-SS <48. ICU and hospital mortality and length of stay (LOS) were recorded in all the patients.

Results 94 sequential awakening patients were recruited; 68.1% males (n=64), with a mean age for the whole cohort of 64.5±15.3 years. 29 patients were unable to successfully complete the 4 one-stage commands as a result of cognitive impairment. 65 patients completed the MRC-SS of whom 73.9% demonstrated ICU-AW at awakening. Results are shown in Abstract P67 table 1.

Abstract P67 Table 1 Summary of test characteristics of MRC-SS

Test characteristic	ICU mortality		ICU LOS (≤14; >14 days)		Hospital mortality		Hospital LOS (≤28; >28 days)	
	UTC	ICU-AW	UTC	ICU-AW	UTC	ICU-AW	UTC	ICU-AW
Sensitivity	0.69	0.88	0.22	0.93	0.56	0.81	0.17	0.84
Specificity	0.84	0.28	0.64	0.41	0.84	0.29	0.56	0.41
PPV	0.62	0.15	0.28	0.54	0.69	0.27	0.28	0.67
NPV	0.88	0.94	0.57	0.88	0.75	0.82	0.42	0.65

UTC (n=29). MRC-SS <48 (n=48). MRC-SS ≥48 (n=17).

ICU, Intensive Care Unit; ICU-AW, intensive care unit-acquired weakness; LOS, length of stay; NPV, negative predictive value; PPV, positive predictive value; UTC, unable to complete 4 one-stage commands.

Conclusion Almost a third of critically ill patients, from a sequential cohort, were unable to complete 4 one-stage commands and thus could not perform the MRC-SS. Although inability to successfully complete the one-stage commands conferred limited predictive value, those patients that could perform this task were more likely to survive ICU. Similarly an MRC-SS <48 at awakening, presumed indicative of ICU-AW, conferred limited predictive value. However an MRC-SS =48 predicted ICU and hospital survival as well as an ICU LOS <2 weeks. These data highlight the limitations of volitional tests in critically ill patients. It clearly challenges the current view that ICU-AW, as measured by volitional tests, is a predictor of poor outcome. These data confirm that preserved peripheral strength predicts a good outcome.