Introduction Vitamin D is important in innate and adaptive immunity. Deficiency is associated with susceptibility to tuberculosis(TB) and viral respiratory tract infections. Prevalence increases in patients of Black and Asian ethnicity, high BMI, smokers and the elderly. Vitamin D deficiency may have a role in acquisition and severity of COVID-19 infection.
Objective To investigate vitamin D status in patients admitted to hospital and critical care with COVID-19, and to compare vitamin D levels to patients with TB infection.
Methods Vitamin D levels were measured prospectively in adult patients admitted to three medical wards and HDU/ITU with suspected COVID-19 infection between 6/4/20 and 4/5/20. Data was supplemented by retrospectively screening admissions between 1/3/20 and 31/5/20 with PCR confirmed COVID-19 infection or highly suggestive chest radiology with a Vitamin D level within 3 months. Adult patients treated for latent and active TB between 1/1/18 to 30/6/20 had Vitamin D levels measured at treatment start. Patients were stratified as Vitamin D deficient(<25 nmol), insufficient(26–50 nmol) or sufficient(>50 nmol).
Results Vitamin D levels were available for 244/551(44%) patients admitted with confirmed COVID-19, including 62/113(55%) ITU/HDU admissions, and for 230/237(97%) TB patients. Overall, 195/244(76%) inpatients with COVID-19 had vitamin D <50 nmol (104/244(43%) deficient and 81/244(33%) insufficient, median 29 nmol), compared with 177/230(77%) patients with TB infection (79/230(34%) deficient and 98/230(43%) insufficient, median 34.2 nmol).

Demographics: COVID-19 inpatients were aged 22–97 (median 66 yrs); ethnicity White 120/244(49%), Black 68/244 (28%), Asian 14/244(6%); current smokers 8/244(3%), ex-smokers 50/244(20%), non-smokers 160/244(66%); BMI was recorded in 180/244(74%), 33.9% BMI >30 kg/m^2.

Vitamin D levels were not lower in COVID-19 patients requiring respiratory support or those that died- 76% of discharged patients were insufficient/deficient, compared to 69% requiring respiratory support and 70% that died. There was no significant difference in proportion of insufficient/deficient patients with ethnicity- White 89/120(74%), Black 52/68 (76%), Asian 11/14(78%).

Patients with active TB had lower vitamin D than patients with latent infection, but similar levels to patients with COVID-19(median 28.5 mol, 51% deficient, vs 40.8 nmol, 17% deficient vs 29 nmol, 43% deficient).
Conclusion Three-quarters of patients admitted with COVID-19 had low Vitamin D levels, proportionately similar to patients with TB infection. There was no correlation with disease severity.

P195 SECONDARY INFECTION RATES AND ANTIBIOTIC PRESCRIBING IN A COVID-19 HDU POPULATION

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Introduction Secondary infection in COVID-19 has been associated with adverse outcomes and high mortality. The prevalence of secondary infection in COVID-19 and optimal antimicrobial strategies remain unclear.
Methods Retrospective case-note review of patients with COVID-19 admitted to our institution's high dependency unit (HDU) from March to June 2020. Patients were PCR-positive for SARS-CoV-2 or had classical CT appearances and a compatible clinical presentation for COVID-19. Microbiological tests, antimicrobial prescriptions and clinical outcomes were recorded.
Results 84 patients were identified. Median age was 68.5 years and 29/84 (34.5%) were female. Respiratory support included HFNO (n=39), CPAP (n=56), non-invasive ventilation (n=3) and invasive ventilation (n=14). Overall mortality was 36/84 (42.9%).

6/84 patients (7.1%) had evidence of secondary infection (>10^5 CFUs on bronchoalveolar lavage (BAL); positive sputum culture or positive blood culture excluding skin contaminants).

28/84 (33.3%) had a respiratory sample sent: BAL n=10; sputum culture n=2; *Legionella* antigen n=15; throat swab multiplex PCR n=3; Biofire respiratory viral panel n=7. BAL was positive in 3/10 cases (*Enterococcus faecium; Serratia marcescens* and *Escherichia coli; Pseudomonas aeruginosa*). One sputum culture was positive for *M. abscessus*.

71/84 (84.5%) had blood cultures. 8 (11.2%) were positive, of which 6 were considered skin contaminants and not deemed true secondary infection (coagulase negative *Staphylococci* n=5; *Lysinibacillus* sp. n=1; *Proteus mirabilis* n=1; *Staphylococcus epidermidis* and *Serratia marcescens* n=1).

All 84 patients received antimicrobials. 32 (38.1%) received a macrolide, predominantly azithromycin. Macrolide usage was not associated with mortality or admission length, but was associated with increased intubation rate (28.1% vs 9.6%, p=0.027)

Initial antibiotic treatment was monotherapy in 45 (53.6%) cases and dual therapy in 39 (46.4%). Initial treatment with two antibiotics versus monotherapy was not associated with mortality but was associated with increased intubation rate (25.6% vs 8.9%, p=0.040) and increased mean admission length (16.5 vs 11.6 days, p=.036).
Discussion Robust evidence of secondary infection in patients with COVID-19 was uncommon in our cohort. Increased intubation rates in patients prescribed a macrolide and those initially prescribed dual antibiotic therapy is likely to reflect more severe disease. There is considerable potential for enhanced antimicrobial stewardship in further waves of COVID-19.

P196 INFLUENZA VACCINATION, AIRWAYS DISEASE AND THE RISK OF COVID-19 RELATED MORTALITY

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Introduction UK public health policy emphasises the need for increased influenza vaccination during the COVID-19 pandemic. However, there are claims on social media that influenza vaccination increases risk of adverse outcomes in SARS-CoV-2 infection that may compromise uptake, especially in high risk groups such as those with airways disease. There is also emerging evidence that inhaled corticosteroids (ICS) may modify this risk. We therefore sought to urgently assess the risk of morbidity and mortality in individuals admitted with COVID-19, and whether this influenced by influenza vaccination, airways disease and ICS use.