

## 'Research Round Up- Prescribing for Respiratory Disease

### Introduction

The last research round up provided you with an overview of some papers covering the impact of non-medical prescribing in some clearly defined settings. This month we are going to be looking at Respiratory Disease. The articles reviewed look at delayed prescribing in upper respiratory tract infections, testing and prescribing for lower respiratory tract infections and finally the association between pre-existing respiratory disease and COVID-19.

### The Safety of Delayed Versus Immediate Antibiotic Prescribing for Upper Respiratory Tract Infections

TP van Staa, V Palin, B Brown, W Welfare, Y Li, & DM Ashcroft (2021) *The Safety of Delayed Versus Immediate Antibiotic Prescribing for Upper Respiratory Tract Infections* Journal of Clinical Infectious Diseases; 73:2- e394-e401

This original research study, published in the Journal of Clinical Infections diseases, aimed to provide an overview evaluation of the clinical safety of delaying antibiotic commencement for upper respiratory tract infections (URTIs) and comparing outcomes with those who received an immediate prescription. Delayed prescribing is included in treatment guidelines for clinically less severe URTIs and the researchers used infection related hospital admission after 30 days as the outcome of interest. Data was obtained from the English Clinical Practice Research database for one cohort, the second cohort in this study had data collected from the Welsh Secure Anonymized Information linkage. These databases contain electronic health records for primary care patients, but they are also linked to hospital admission records for said patients. The diagnosis of URTI was searched for and correlated with patients who had been prescribed one of the following 5 antibiotics: amoxicillin, clarithromycin, doxycycline, erythromycin, or phenoxymethylpenicillin. Once these patients were identified, they data was then stratified according to whether the prescription had been generated immediately at the point of diagnosis or had been delayed dependent upon progression of the URTI. For all patient data included, the outcome of interest was as above, infection related hospital admission after a 30 day period.

Included data led to 1.4 million data sets being included form the English database and 0.4 million form the Welsh data base giving 1.82 million participant data sets included in the analysis. Of this it was found that 91.7% had an antibiotic at URTI diagnosis date (immediate) and 8.3% had URTI diagnosis in 1–30 days before a prescription was issued (delayed). Further analysis showed that delaying the prescription of antibiotics correlated with a 52% increase in the risk of infection leading to a hospital admission. The probability of delayed antibiotic prescribing was unrelated to predicted risks of hospital admission. Analyses of the number needed to harm showed considerable variability across different patient groups.

The authors report this as the first large population based study that set out to determine the safety of the practice of delayed antibiotic prescriptions. They suggest that delaying the commencement of antibiotic therapy in URTI is associated with an increase in the incidence of hospital admission for the condition. They suggest there is a need to better target delayed antibiotic prescribing to URTI patients with lower risks of complications.

<https://academic.oup.com/cid/article/73/2/e394/5864470>

Effect of C reactive protein point-of-care testing on antibiotic prescribing for lower respiratory tract infections in nursing home residents: cluster randomised controlled trial

Boere, T.M., van Buul, L.W., Hopstaken, R.M., Van Tulder, M.W., Twisk, J.W.M.R., Verheij, T.J.M. & Hertogh, C.M.P.M. (2021) *Effect of C reactive protein point-of-care testing on antibiotic prescribing for lower respiratory tract infections in nursing home residents: cluster randomised controlled trial* BMJ;374:n2198

This cluster randomised controlled study, published in the BMJ sought to determine if the measurement of C-reactive Protein (CRP) at the point of care is associated with a safe reduction in the prescription of antibiotics for lower respiratory tract infections (LRTIs) in a population of nursing home residents in the Netherlands. Antimicrobial resistance is a worldwide issue and antimicrobial stewardship as a public health initiative is of paramount importance. The authors outline that antibiotic use in respiratory disease is prevalent and some of it may be unnecessary. They postulate that C reactive protein point of care testing could be used to assist in prompt and appropriate decision making of whether or not antibiotic prescribing was necessary.

The study included 84 physicians from 11 nursing home organisations included 241 participants with suspected lower respiratory tract infections from September 2018 to the end of March 2020 using a simple randomised procedure resulting in 6 intervention groups using the C reactive protein point of care test and 5 control groups who did not.

The primary outcome measure was antibiotic prescribing at initial consultation and diagnosis (yes or no). There was a secondary outcome measures of if there was full recovery at three weeks according to the attending physician, changes in antibiotic treatment and additional diagnostics due to complications during follow-up at one week and three weeks, and hospital admission and all-cause mortality at any point (baseline, one week, or three weeks).

The study found that 53.5% of patients in the intervention group were prescribed antibiotics at diagnosis compared to 82.3% in the control group. Differences in secondary outcomes between the intervention and control groups were 4.4% in full recovery rates at three weeks (86.4% v 90.8%), 2.2% in all-cause mortality rates (3.5% v 1.3%), and 0.7% in hospital admission rates (7.2% v 6.5%). The odds of full recovery at three weeks, and the odds of mortality and hospital admission at any point did not significantly differ between groups.

From these findings the authors conclude that use of C reactive protein point of care testing for URTi had been shown to safely reduce antibiotic prescribing compared with usual care in nursing home residents. The findings suggest that implementing CRP POCT in nursing homes might contribute to reduced antibiotic use in this setting and help to antibiotic stewardship and help reduce the incidence of antimicrobial resistance.

<https://www.bmj.com/content/374/bmj.n2198.full>

## Association between pre-existing respiratory disease and its treatment, and severe COVID-19: a population cohort study

P Aveyard, M Gao, N Lindson, J Hartmann-Boyce, P Watkinson, D Young, C A C Coupland, P San Tan, A K Clift, D Harrison, D W Gould, I D Pavord, & J Hippisley-Cox (2021) *Association between pre-existing respiratory disease and its treatment, and severe COVID-19: a population cohort study*, *The Lancet Respiratory Medicine*; 9:8:909-923

This study, using a population cohort design, aimed to examine the association between chronic respiratory disease and use of inhaled corticosteroids on the risk of contracting severe COVID-19. The authors refer to previous studies which suggest that the prevalence of chronic respiratory disease in patients hospitalised with COVID-19 was lower than its prevalence in the general population. The aim of this study was to assess whether chronic lung disease or use of inhaled corticosteroids (ICS) impacts upon the risk of contracting severe COVID-19.

The authors obtained records from 1205 general practices in England that contribute to the QResearch database and were linked to Public Health England's database of SARS-CoV-2 testing and English hospital admissions, intensive care unit (ICU) admissions, and deaths for COVID-19. All patients aged 20 years and older who were registered with one of the 1205 general practices on Jan 24, 2020, were included in this study. Outcome measures of interest were the risks of COVID-19-related hospitalisation, admission to ICU, and death in relation to respiratory disease and use of ICS, adjusting for demographic and socioeconomic status and comorbidities associated with severe COVID-19.

The study included 8 256 161 people who fit the cohort criteria between January and April 2020. Of those 0.2% were hospitalised with COVID-19 and <0.1% into ICU. Of the cohort 0.1% died. The study found that patients with pre diagnosed respiratory disease were at a higher risk of being hospitalised. These conditions included COPD, Asthma, bronchiectasis, sarcoidosis, alveolitis, pulmonary fibrosis, interstitial lung disease and lung cancer. The study also showed that previous respiratory conditions were associated with an increased risk of death from COVID-19 compared to patients with none of these conditions. A post hoc analysis of data revealed that relative risks of severe COVID-19 in people with respiratory disease were similar before and after shielding was introduced on March 23, 2020. In another post-hoc analysis revealed that people with two or more prescriptions for inhaled corticosteroids in the 150 days before study start were at a slightly higher risk of severe COVID-19 compared with all other for hospitalisation, ICU admission, and death.

The authors conclude that the risk of severe COVID-19 in people with asthma is relatively small. People with COPD and interstitial lung disease appear to have a modestly increased risk of severe disease, but their risk of death from COVID-19 at the height of the epidemic was mostly far lower than the ordinary risk of death from any cause. Use of inhaled steroids might be associated with a modestly increased risk of severe COVID-19.

<https://www.sciencedirect.com/science/article/pii/S2213260021000953>

### Conclusion

Prescribing for the treatment and management of respiratory conditions is a common area of practice. From management and stabilising of long-term chronic conditions to the acute management of exacerbations or infection we see a wide range of medications in use and these patients make up a large proportion of patients seen in primary and secondary care. These articles should be of interest to a wide range of practitioners, not just those in the respiratory services.