Abstract P160 Table 1  Summary of absolute viral load (log_{10} copies/mL) through Day 28, as measured by qRT-PCR from nasal/oropharyngeal swabs

<table>
<thead>
<tr>
<th>Visit</th>
<th>Viral load (log_{10} copies/mL)</th>
<th>Sotrovimab (500 mg IV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>n</td>
<td>188</td>
</tr>
<tr>
<td>Day 7</td>
<td>n</td>
<td>4.35</td>
</tr>
<tr>
<td>Day 14</td>
<td>n</td>
<td>2.36</td>
</tr>
<tr>
<td>Day 28</td>
<td>n</td>
<td>0.55</td>
</tr>
</tbody>
</table>

Note: Baseline log_{10} viral load was defined as the non-missing assessment taken at Day 0, excluding the negative viral load results. The post-baseline viral load values with Ct value > 38 were imputed as half the lower limit of detection (i.e. 453 copies/mL, 95% CI: 226.5). Negative viral loads were defined as Ct ≥ 45 and were imputed as 3.57 copies/mL. These imputed values were used to derive log_{10} viral loads. Ct, cycle threshold; IV, intravenous; qRT-PCR, quantitative real-time reverse transcriptase polymerase chain reaction.

Poster sessions

P161  ANTIVIRAL EFFECTS OF A NOVEL NANOEMULSION FORMULATION OF NIRMATRELVIR FOR A NASAL DELIVERY ON CORONAVIRUS INFECTION IN HUMAN NASAL EPITHELIUM

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Background During COVID19 pandemic, a small molecule antiviral agent PAXLOVID™ was authorised for emergency use. The main antiviral component is nirmatrelvir, a coronavirus M^{PRO} inhibitor, but it was combined with ritonavir to achieve persistent cell exposure. Respiratory virus usually infects through the nose and intranasal treatment is an attractive option for prophylactic treatment but challenging. Therefore, alternate strategies to deliver and retain nirmatrelvir within a treated cell is of great importance.

Aim The aim of this project is to investigate antiviral effects of nirmatrelvir in a novel nanoemulsion formulation on coronavirus infected human primary nasal epithelium.

Method Seasonal coronavirus (HCOV-229E) was inoculated to the apical surface of air liquid interface (ALI) cultured human primary nasal epithelium. Viral load in apical wash was determined by a 50% tissue culture infectious dose (TCID_{50}) assay and RT-PCR. Cell integrity, a marker of cell damage by virus infection, was measured as a transmembrane electrical resistance (TEER). 50 μL of nirmatrelvir (0.1 μM) prepared in water or as a nanoemulsion was applied to apical surface of ALI nasal epithelium for 10 min, and virus inoculum (0.2 MOI) was then applied to apical surface on top of the treatment for 1 hr. Apical surface wash with media was collected after treatment, then 1, 2 and 3 days post virus inoculation.

Results HCoV viral load was maximal at Day 1 post inoculation. Analysis of the area under the curve (AUC) of viral load for 3 days post inoculation revealed that nirmatrelvir in water, nanoemulsion alone, and nirmatrelvir in nanoemulsion showed 69.5%, 89.8% and 100% inhibition of viral load vs. control, respectively. RT-PCR AUC was also inhibited by 13.5%, 52.2% and 100%, respectively, suggesting nirmatrelvir and nanoemulsion component showed synergistic effects. The nirmatrelvir in nanoemulsion also protected from virus induced reduction of TEER. The nirmatrelvir in nanoemulsion was well tolerated and not cytotoxic.

Conclusion Novel nanoemulsion formulation of nirmatrelvir was found to show better antiviral effects against COV infection in human primary nasal epithelium.

Please refer to page A291 for declarations of interest related to this abstract.

P162  EPIDEMIOLOGICAL RISK FACTORS FOR DEVELOPING LONG COVID: A RAPID REVIEW WITH META-ANALYSIS

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10.1136/thorax-2023-BTSabstracts.312

Background Several studies have found that male sex, older age, obesity, and obesity-related factors such as diabetes, hypertension, and cardiovascular disease are risk factors for symptomatic COVID-19. Few studies have investigated factors associated with the clinical course of COVID-19 and the transition to long COVID.

Aim To conduct a rapid review and meta-analysis of the evidence on epidemiological factors associated with the clinical course of COVID-19 and the development of long COVID.

Methods A systematic search of PubMed, Embase, and WHO COVID database was performed. Studies were included if they were published in English and reported results from original research. Studies were excluded if they did not report risk factors for long COVID.

Results A total of 51 studies were included in the meta-analysis. Risk factors associated with the development of long COVID included male sex, older age, obesity, diabetes, hypertension, and cardiovascular disease.

Conclusion The results of this meta-analysis suggest that male sex, older age, obesity, diabetes, hypertension, and cardiovascular disease are risk factors for the development of long COVID.

Please refer to page A291 for declarations of interest related to this abstract.

A204  Thorax 2023;78(Suppl 4):A1–A311

Poster sessions

Please refer to page A291 for declarations of interest related to this abstract.
Introduction Long COVID, characterized by persistent symptoms after the acute phase of SARS-CoV-2 infection, affects an estimated two million (3.1%) people in the UK. However, the epidemiological risk factors for developing this condition remain poorly understood. This study aimed to review the current literature and conduct a meta-analysis of the risk factors associated with long COVID.

Methods MEDLINE database was searched. Multivariate regression analysis studies exploring sex, age or comorbidities as risk factors were included. All studies required > 100 adult participants with laboratory-confirmed COVID-19 and follow-up at least four weeks following diagnosis. The risk of bias was assessed using the JBI critical appraisal tool. For risk factors that met eligibility criteria for meta-analysis, a provision of pooled estimates via a random-effects meta-analysis was conducted.

Results Of 2585 studies screened, ten studies were included in this review; presenting data on 5,387 patients (mean age 51.6 ± 17.9, 47.5% female). Meta-analysis of seven studies found female sex to be a risk factor for long COVID (OR 1.90, 95% CI 1.66 to 2.18). Meta-analysis of four studies found comorbidities to also be a risk factor (OR 1.46, 95% CI 1.16–1.83), and one study found COPD to be a specific risk factor. Four studies explored older age as a risk factor; just one observed significant results.

Conclusion Despite good quality data demonstrating female sex as a risk factor, evidence for the other risk factors, especially age and specific comorbidities, is heterogeneous. Considering the large burden of disease associated with long COVID, research must continue to further understand this condition.

REFERENCE

‘Two Way Traffic’ – Challenging the status quo in asthma

P163 INHALED AND ORAL CORTICOSTEROID TREATMENT HIGHLIGHTS DIFFERENTIAL EFFECTS IN BLOOD AND AIRWAY COMPARTMENTS IN TYPE-2 HIGH ASTHMA

Exhaled nitric oxide (FeNO) and blood eosinophilia are important biomarkers of type-2 inflammation with additive predictive value in asthma. We have shown that high FeNO correlates with chemokines and cytokines involved in epithelial signalling whilst blood eosinophil levels correlate with serum interleukin-5 only. 1 This suggests that FeNO more accurately reflects inflammation in the airway ‘compartment’ and blood eosinophil count reflects the systemic ‘compartment’ in eosinophilic asthma. We now test the hypothesis that the effect of low dose inhaled corticosteroids and oral corticosteroids, both effective treatments for eosinophilic airway inflammation, have differential effects on the airway (reflected by FeNO) and systemic compartment (reflected by blood eosinophils) in patients with eosinophilic asthma.