

# Frequency of Superadded Infections in Older Adults with COVID-19

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## Background

Superadded infection is thought to be as uncommon as 7% in patients presenting with COVID-19. Past research predominantly describes findings concerning bacterial pneumonias in mixed patient cohorts, who are already infected by the novel coronavirus.<sup>1</sup> The burden of any possible coinfections in an elderly patient population is not known. This research looks to improve the investigatory behaviours of clinicians by determining the frequency of superadded infection in older COVID-19 patients.

## Method

To investigate the frequency of superadded bacterial infections in COVID-19 patients at the Department of Medicine for the Elderly (DOME) at Glasgow Royal Infirmary we assessed documentation of all COVID-19 patients admitted to DOME between 1<sup>st</sup> October 2020 and 1<sup>st</sup> December 2020 and noted any recorded infections that occurred within the first two weeks. We sought to establish how many patients had a diagnosis of an infection other than COVID-19.

## Results

Results revealed that, of the 266 patients, 43.6% (n=116) had a superadded infection within two weeks of their COVID-19 diagnosis. Of these, 22.2% (n=59) had concurrent positive urine cultures; *Escherichia coli* being the most common organism responsible, 13.2% (n=35) had concurrent lobar consolidation on chest X-ray reports, 3.76% (n=10) had concurrent positive blood cultures with the most common infectious agent being *Escherichia coli*, 3.0% (n=8) had concurrent positive sputum cultures with *coliform bacteria* being the most common infectious agent.

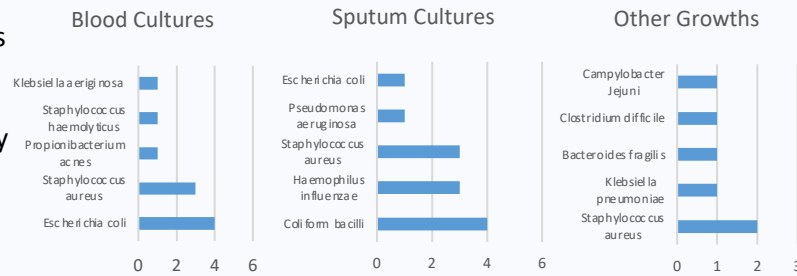


Figure 1. Detection frequency for causative organisms identified through blood cultures, sputum cultures or other methods of investigations and caused superadded infection in DOME patients with concurrent COVID-19.

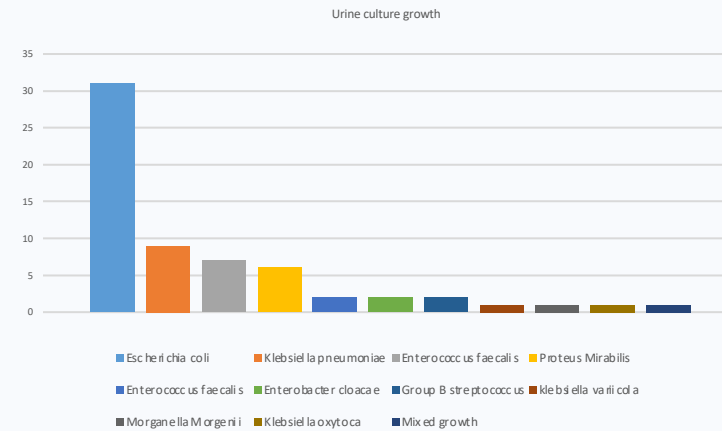


Figure 2. Detection frequency for all organisms that caused superadded infection in DOME patients with concurrent COVID-19.

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## Discussion

Our results were mostly in keeping with other COVID-19 patient groups.<sup>2,3,4</sup> However, the frequency of positive urine cultures were higher in this patient cohort when contrasted with a comparison group.<sup>5</sup> This could be explained by the greater average age in our patients (80 vs 62). *Escherichia coli* was most commonly detected in urine. This is known to be more prevalent and more resistant to standard first line therapy in older patients<sup>6</sup>, therefore sending a urine culture for analysis may be exceptionally warranted in older COVID-19 patients with symptoms of UTI. Stool culture and skin swab results were also counted, revealing that two patients had a positive skin swab and two patients had positive stool sample findings. It is also worth noting that multiple organisms would sometimes be detected in a single specimen. Additionally, lobar consolidation was not always followed up with a sputum culture. This may reflect effective use of local guidelines and empirical therapies to treat respiratory tract infections. Additionally, eight patients who had lobar consolidation had concurrently been diagnosed with aspiration pneumonia. It could be argued that an aspiration pneumonia is not in keeping with the definition of a superadded infection with COVID-19.

## Conclusion

In this cohort of hospitalised older adults with COVID-19 infection, there was evidence of superadded bacterial infection in almost half of the cases. These findings support the use of additional investigations for sources of infection other than SARS-CoV-2 in older adult patients.