Very high use of antibiotics in COVID-19 treatment could be reduced

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The very high use of antibiotics in patients hospitalized with COVID-19 is often not necessary, and risks worsening global antimicrobial resistance.

New research led by the University of Glasgow as part of the ISARIC

(International Severe Acute Respiratory and emerging Infections Consortium) WHO Clinical Characterisation Protocol UK (CCP-UK), found that antibiotic use was very high in hospitalized COVID-19 patients in the UK during the first wave despite confirmed bacterial infection being uncommon.

The study, which is published in *The Lancet Microbe* and was conducted in collaboration with the Universities of Edinburgh and Liverpool and Imperial College London, found that overall 85% of COVID-19 patients received one or more antibiotics during their hospital admission, with the highest use in critical care, while 37% of patients were prescribed antibiotics prior to admission.

There was high use of broad-spectrum antibiotics—those active against a very wide range of bacteria—and evidence that this could be reduced by using more targeted but equally appropriate alternatives. Importantly, confirmed bacterial infections in people with COVID-19 were uncommon, especially when first admitted to hospital, so a more restrictive approach to using antibiotics would be safe and should be encouraged. Most of the bacteria identified represented secondary infections which began more than 48 hours from admission.

Researchers also found that secondary infections occurring after hospitalization were not specific to COVID-19 infection and more in keeping with hospital-associated infections and particularly those infections typically seen in intensive care units. These findings will help to inform most appropriate approach to antibiotic prescribing in patients with COVID-19 suspected of having a bacterial infection.

Although co-infections were rarely observed during the first wave of the pandemic there remains a need to monitor hospitalized patients in light of increased use of steroids and other COVID-19 treatments, which may increase susceptibility to bacterial infection. However, the researchers

argue that over-prescription of antibiotics and particularly broad-spectrum antibiotics in the majority of hospitalized patients with COVID-19 raises significant concern regarding the potential detrimental impact on antimicrobial resistance globally. The importance of efforts to safely reduce and control antibiotic prescribing in COVID-19 should not be underestimated.

Dr. Antonia Ho, lead author of the study from the MRC-University of Glasgow Center for Virus Research, said: "Until now, a detailed understanding of the nature of bacterial co-infections identified in patients with COVID-19, and the frequency and types of antibiotics these patients have been prescribed has been lacking. This study demonstrates the very high antibiotic use we see in hospitalized COVID-19 patients may not be necessary, indeed it may contribute to antimicrobial resistance.

"While some COVID-19 patients will require antibiotics, mostly for secondary infections which develop after admission to hospital, our data shows that not all COVID-19 patients should be prescribed antibiotics. The longer someone is in hospital, particularly if they are in critical care, the more vulnerable they are to develop secondary infections, and these should continue to be monitored. However, the bugs we identified are similar to those found in patients with hospital-acquired infection, and not specific to COVID-19."

Dr. Clark Russell, a Clinical Lecturer at the University of Edinburgh said: "Bacterial chest and bloodstream infections are uncommon complications of COVID-19. This work identifies which bacteria tend to cause these infections when they do occur, helping clinicians to make a more informed choice about the best antibiotics to give people when needed."

Prof Calum Semple, Co-Lead of the study said, "We only have safe

surgery and medical cures for many life threatening conditions because antibiotics were discovered and mostly still work. Overuse of antibiotics needs to be avoided to prevent emergence of resistance. When the current threat from COVID-19 subsides, the problem of antimicrobial resistance will remain a threat."

Bacterial co-infections and secondary infections are commonly identified in severe influenza (up to a quarter of cases) and other severe respiratory viral infections, where they are also associated with increased morbidity and mortality. Current national and international COVID-19 guidelines vary in their recommendations on non-targeted antibiotic use. UK guidelines advise against antibiotic use when the respiratory tract infection is thought to be due to COVID-19, without specific evidence of bacterial infection.

The paper "Co-infections, secondary infections, and antimicrobial usage in hospitalized patients with COVID-19 during the first wave from the ISARIC WHO CCP-UK study: a prospective, multicentre cohort study' is published in *The Lancet Microbe*.

More information: Clark D Russell et al, Co-infections, secondary infections, and antimicrobial use in patients hospitalized with COVID-19 during the first pandemic wave from the ISARIC WHO CCP-UK study: a multicentre, prospective cohort study, *The Lancet Microbe* (2021). DOI: 10.1016/S2666-5247(21)00090-2

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