

# Abstract Highlights

The following highlights spotlight several fascinating and timely abstracts presented at the 32<sup>nd</sup> European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), covering topics such as COVID-19, antimicrobial stewardship, and antibiotic resistance.

## Double Antibody Treatment Efficacy in Patients with COVID-19

SEVERE acute respiratory syndrome coronavirus 2 resulted in scientists all around the world collaborating to find a treatment against the deadly virus in an emergency health crisis. Vaccines were developed faster than ever before, as well as antibody treatments, which have the potential to not only protect a person from an infection but also treat the infection.

Last year, two combinations of monoclonal antibodies were approved to treat patients at high-risk of developing severe COVID-19. In an abstract presented at ECCMID 2022, findings revealed the efficacy of double antibody treatment, particularly in patients receiving bamlanivimab/etesevimab or casirivimab/imdevimab.

The study involved 97 patients during the period of March–September 2021. The cohort was predominately male (56%), had a median age of 69 years, and received dual monoclonal antibody therapy for COVID-19. Patients underwent nasopharyngeal swabs at diagnosis and 7 days after receiving monoclonal antibody therapy, as well as sequencing of the virus for all positive COVID-19 samples.

Out of this sample, 49.5% of patients were undergoing immunosuppressive treatment, 13.0% had chronic respiratory insufficiency, and 12.0% were receiving chemotherapy. Unfortunately, 10 of these patients passed away due to COVID-19 and three passed away due to unrelated reasons.

Promisingly, results showed 64% of patients did not require O<sub>2</sub> treatment and only 36% required low-flow O<sub>2</sub>. The viral decay was reported to be similar in patients taking bamlanivimab/etesevimab or casirivimab/imdevimab. Moreover, there were no adverse events reported in patients receiving dual monoclonal antibody treatment, demonstrating that this treatment is safe as well as efficacious.

The authors summarised their findings by emphasising the safety and efficacy of combining monoclonal antibodies for COVID-19 treatment. They also acknowledged how the viral sequencing showed there were different spike mutations in patients, especially in those with the  $\alpha$  variant. This discovery could help with creating more specific treatments in the future. ■

# Is The Use of Corticosteroids Beneficial or Harmful to Patients with COVID-19?

**A**DVANTAGES and disadvantages of the effect of corticosteroids on in-hospital mortality in patients with COVID-19 who were admitted to Spanish intensive care units (ICU) were reported by a multicentre, observational cohort study presented at the 32<sup>nd</sup> ECCMID. Although there is some evidence that corticosteroids might be beneficial in severe COVID-19 cases, there is scarcely any data on certain subgroups of patients diagnosed with COVID-19.

The study included patients with confirmed severe acute respiratory syndrome coronavirus 2 infection who were admitted to 55 ICUs in Spain between February 2020 and October 2021. The included participants had been in the ICU for 2 or more days and had not received prior steroid treatment. The researchers collated demographics, clinical data, corticosteroids treatment data, complications, and outcomes.

During the period of admission in the hospital, 2,877 out of the 3,438 patients in the study (84%) had received systemic corticosteroids. The frequency of in-hospital deaths was unremarkable between those who received corticosteroids treatment (28%) and those who did not receive

the treatment (31%). Following a modification of the confounding variables, it was clear that the use of corticosteroids was protective (hazard ratio: 0.66 [0.54-0.82];  $p < 0.001$ ). Additionally, in the subgroup of patients aged  $\geq 60$  years, in those with higher severity, and in those with high inflammatory response (C-reactive protein:  $\geq 150$  mg/L; lymphocyte count:  $< 0.724 \times 10^9$  cells/L), a beneficial response was reported. There was no association between high dosage of corticosteroids and probability of in-hospital death. It was observed that early administration ( $< 7$  days) was associated with higher likelihood of mortality (hazard ratio: 1.27 [1.07-1.50];  $p = 0.006$ ). Finally, the use of corticosteroids was linked to a greater risk of developing nosocomial bacterial pneumonia, hyperglycaemia, and haemorrhage in the general population.

In conclusion, the findings demonstrated that regardless of the general beneficial effect, a few subgroups of patients, such as young patients, patients with a reduced inflammatory response, and patients with a less severe COVID-19 severity, will not exhibit the same benefit corticosteroids treatment. ■



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## Antimicrobial Stewardship in Children Undergoing Surgery

**S**IMPLE antimicrobial stewardship (AS) intervention based on guidelines provision and education can lead to an increase in the appropriateness of surgical antimicrobial prophylaxis (SAP) timing and duration. In an abstract presented at ECCMID 2022, researchers explored the efficacy of AS intervention in targeting SAP in children at a 1,200-bed paediatric department in Northern Italy.

This pre- and post-intervention retrospective study assessed the appropriateness of SAP before and after an AS educational programme. The appropriateness was evaluated by protocol adherence in indication, timing, dose, and duration. The differences across the intervention groups were measured by the chi-squared test. Data were extracted from medical records of children who had cardiac, neuro-, and orthopaedic surgery.

There were 236 patients in the pre- and 203 in the post-intervention phases (N=439). In total, 372 interventions (84.7%) needed antibiotic administration before surgery. SAP was administered to most cases in both study phases (91.5% versus 91.1%); there were no significant

changes in the type of surgical interventions. The rate of patients who received any SAP dose after surgery reduced (from 85.2% to 55.7%;  $p < 0.001$ ), and SAP timing was deemed more appropriate after the AS intervention (from 49.1% to 81.1%;  $p < 0.001$ ).

While patient-related risk factors for surgical site infections (SSI) increased (23.3% versus 45.3%;  $p < 0.001$ ), the rate of SSIs remained stable across both phases (3.8% pre-AS versus 4.4% post-AS;  $p = 0.740$ ). However, there was a reduction in the length of hospital stay by 3.2 days ( $p = 0.04$ ) after AS implementation.

The researchers also found that there were no significant changes in the use of antibiotic combinations (5.1% versus 8.6%;  $p > 0.05$ ).

Although there was a significant increase in patient-related risk factors for SSIs after AS intervention, SSI rates were in fact stable. This study shows that AS intervention that is based on education and the provision of guidelines can increase the appropriateness of SAP usage with regard to timing and duration, resulting in a decrease in length of hospital stay. ■

# Antibiotics Prescribed Inappropriately to Children in Low- and Middle-Income Countries



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**A**NTIBIOTIC resistance is rising to dangerous levels globally, particularly within low- and middle-income countries. Often, antibiotics that are required as a treatment for resistant infections are unaffordable. Low- and middle-income countries are also faced with high levels of bacterial disease, particularly amongst the child population.

One significant factor in antibiotic resistance is the inappropriate prescription of antibiotics. In low- and middle-income countries, data are often unavailable, particularly as the majority of the population is treated outside of medical institutions. A study aimed to discover the pattern of inappropriate antibiotic prescriptions in children in Madagascar, Senegal, and Cambodia.

Data from a prospective, multicentric, community-based mother-to-child cohort (BIRDY, 2012–2018) recorded all infectious episodes in babies up to the age of 2 years. Results were taken from urban and rural areas in these three countries, including 3,710 children in the cohort. Every case of infection, with symptoms, diagnosis, and antibiotics prescribed, were examined. The study defined unnecessary prescriptions based on the diagnosis of probable bacterial infection.

In the study population, 11,762 consultations took place, 3,448 (29%) of which concluded with an antibiotic prescription. Thirty-six percent of all prescriptions consisted of amoxicillin, and 20.1% were cephalosporins. The study discovered that 57.2%, 15.5%, and 57.0% of prescriptions in Senegal, Cambodia, and Madagascar, respectively, were inappropriate. The most common disease for antibiotic prescription was bronchiolitis (43.9%), followed by gastroenteritis (35.5%), and rhinopharyngitis (20.0%).

The study also found that babies older than 3 months, with a diagnosis that had a higher severity score, increased the risk of inappropriate antibiotic prescription in all three countries. Children living in urban areas were less at risk of receiving inappropriate prescriptions.

The conclusion of the study demonstrated that due to a noteworthy percentage of inappropriate prescriptions across Madagascar, Senegal, and Cambodia, it is pivotal to create reliable local programmes that could optimise prescriptions of appropriate antibiotics on a community level. ■



## Ceftazidime-Avibactam plus Aztreonam for the Treatment of Metallo- $\beta$ -Lactamase-Producing Gram-Negative Bacterial Infections

IN AN abstract presentation session presented at the 32<sup>nd</sup> ECCMID, researchers from the Hospital Universitari Vall D'Hebron, Barcelona, Spain, shared the findings of their novel study investigating the optimal treatment of metallo- $\beta$ -lactamase-producing Gram-negative bacteria (MBL-GNB). Currently optimal treatment of this category of bacteria is not well defined. Ceftazidime-avibactam plus aztreonam (CAZ-AVI/ATM) has previously been used to treat some patients, and the aim of the present study was to evaluate the effectiveness and safety of using CAZ-AVI/ATM to treat MBL-GNB infections.

The retrospective study analysed patients who were treated with CZ-AVI/ATM for MBL-GNB infections between November 2018 and June 2021. Twenty-three patients were included, with a median age of 64 years. The primary outcomes assessed were clinical failure at Day 14 and 30-day mortality. Synergy was evaluated through gradient strip test direct overlay using 90° angle methods.

The patient cohort represented a variety of GNB infections. Eleven patients were immunosuppressed (47%); seven had soft tissue infection (30%); six with lower tract respiratory infection (26%); three with bloodstream infections (13%); three with intra-abdominal (13%); two with occult bacteraemia (9%); one with osteomyelitis (4%); and one with urinary tract infection (4%).

Synergy tests of the combination between CAZ-AVI and ATM were performed, showing synergistic activity in 11 isolates and no synergism in one. Results of the investigation demonstrated that the median duration of the treatment was 15 days, two patients presented with clinical failure at Day 14 (9%) and three died within the first 30 days (13%). Furthermore, three patients presented with adverse effects: two with diarrhoea and one with encephalopathy.

The authors of the study concluded that in the cohort of GMB infections, CAZ-AVI-ATM was a safe and effective therapy. They summarised that this treatment should, therefore, be considered for treating MBL-GNB infections in the future. ■