

In-hospital antimicrobial usage in COVID-19 patients and multidrug-resistant organisms incidence (COVAM): A multi-centre study

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ABSTRACT

Introduction: Increased antimicrobial prescriptions among COVID-19 patients raised concerns about multidrug-resistant organisms (MDRO). We aimed to investigate the in-hospital antimicrobial usage among COVID-19 patients, the incidence of MDRO, and factors associated with antimicrobial prescriptions. **Methods:** This two-year cross-sectional study extracted medical records of COVID-19 patients admitted to the 10 government-funded hospitals in Perak State, Malaysia. Cases were proportionately sampled from each facility using simple random sampling. The need for antimicrobials, oxygen support, immunomodulator, and antiviral therapy was collected. The COVID-19 severity upon admission with the worst stage during hospitalisation, laboratory findings, culture and sensitivity results, and COVID-19-related complications were included. A sample size of 480, including 20% dropout was estimated. Binary logistic regression analysis was used. **Results:** Of 476 COVID-19 cases, 167 (35.1%) and 13 (2.7%) patients prescribed antibiotics and antifungals, respectively. There were 396 prescriptions; antibiotics accounted for 381, and antifungals 15. Beta-lactam inhibitor combination (n=206) and echinocandins (n=9) were the most prescribed antimicrobials. Antibiotics were mostly prescribed in non-intensive care settings (n=275), whereas antifungals were mostly prescribed in intensive care settings (n=10). Of 119 cases prescribed with antimicrobials with cultures taken, 10 detected MDRO, with *Stenotrophomonas maltophilia* being the commonest. Higher odds of antimicrobial prescription were seen in cases with immunomodulator use (p-value <0.001) and COVID-19-related complications (p-value <0.001). **Conclusion:** Antimicrobial usage was at a lower limit than in previous studies (34.2%-71.0%). Similarly, the incidence of MDRO was also at a relatively lower range compared with existing literature. Antimicrobial prescriptions were significantly associated with immunomodulator use and COVID-19-related complications.