Guideline on Antibiotic Stewardship in the context of COVID-19

1. Introduction

Antibiotic resistance is a global health concern and prescribing of antibiotics in COVID-19 will add to the already increasing global challenge of antimicrobial resistance. Bacterial co-infections in patients with COVID-19 are very rare and secondary bacterial infections / super infections are mostly seen in critically ill patients according to the literature. It has been observed that many patients with COVID-19 are prescribed on antibiotics in the early stage of the disease in Sri Lanka, which is not necessary most often.

Antibiotic stewardship is the effort to measure and improve how antibiotics are prescribed by clinicians and used by patients. Improving antibiotic prescribing and use is critical to effectively treat infections, protect patients from harm caused by unnecessary antibiotic use and combat antibiotic resistance.

2. Best practices when prescribing antibiotics in COVID-19

- Antibiotics are not indicated when COVID-19 is suspected or confirmed as bacterial co-infections are rare.
- Early identification of SARS-CoV-2 through rapid antigen or PCR testing should be conducted in suspected patients to reduce unnecessary antibiotic prescribing
- If SARS-CoV-2 infection is confirmed, and the patient is on antibiotics, the antibiotic prescription should be reviewed and discontinued unless there is clear evidence of bacterial co-infection
- Routine use of empirical antibiotics in management of COVID-19 confirmed patients is not recommended.
- Avoid the use of azithromycin as an antiviral agent to treat COVID-19 infection
- Objective evidence for bacterial super-infection include a combination of factors like, rise in leukocyte counts, neutrophilia, lobar consolidation or evidence of necrotizing infection on chest imaging, purulent respiratory secretions, recrudescence of fever after initial defervescence and rapid rise in inflammatory markers (CRP, Procalcitonin)
- Indication for antibiotics must be clearly defined and care must be taken to prescribe only to those where bacterial infection is suspected
- When antibiotics are prescribed, they should target the likely bacterial pathogens and relevant cultures should be taken prior to antibiotics.
- If nosocomial infection is suspected, decision for selection of empirical antibiotic can be guided based on the duration of hospital stay, presence of medical devices, medical/surgical interventions done, local epidemiology and antibiotic resistance patterns in the locality. Correct dose and dosing frequency is recommended, and shorter course therapy should be targeted. Advice from a consultant microbiologist is warranted.
- If broad spectrum antibiotic is started it should be reviewed after 48 hours to decide on stepping down to a narrower spectrum antibiotic depending on the culture and ABST results whenever possible
- Interpretation of culture results should always be co-related with the clinical and other parameters

3. Antibiotic stewardship in home-based management of COVID-19 patients

Patients who are asymptomatic and having mild disease are managed at home and bacterial co-infections and superinfections are extremely rare. Antibiotics are not indicated for these patients unless a bacterial infection is clearly evident.

Antibiotics will not be helpful in uncomplicated COVID-19 infection, and it will cause more harm by disrupting the normal microbiome and selecting out antibiotic resistant flora

4. Antibiotic stewardship in hospital outpatient departments, clinics and other outpatient treatment facilities (Public and private sector hospitals and medical centers)

Patients presenting to outpatient departments with symptoms suggestive of COVID-19 should be screened for SARS COV-2 and positive patients should be assessed for the severity of the disease.

COVID-19 positive patients decided to be treated on home-based care should not be prescribed with antibiotics.

5. Antibiotic stewardship in patients treated at Intermediate Care Centers (ICC).

Patients who are not eligible for home based care and having mild disease are admitted to ICC.

Antibiotic prescription for patients managed at ICC is not recommended unless clearly indicated following an assessment by a medical officer.

6. Antibiotic stewardship in suspected and confirmed COVID-19 patients managed at hospital wards

These patients are often having mild or moderate COVID-19 infection and bacterial co-infection is still rare but secondary bacterial pneumonia with hospital acquired pathogens is a possibility in the long run with challenging infection prevention and control measures.

- Do not prescribe or escalate antibiotics and discontinue those commenced prior to admission, for **patients with suspected or confirmed of COVID-19**, without a clear indication of bacterial infection.
- Do not use CRP alone to guide initiation, escalation or stopping of antibiotics in COVID-19 patients
- For patients antibiotics are indicated, obtain relevant cultures before starting or escalation of antibiotics
- Do not start broad spectrum antibiotics for COVID-19 non-critical patients with **suspected community acquired bacterial pneumonia** unless the patient is in sepsis. Follow the national or hospital antibiotic guideline on treatment of community acquired pneumonia.
- COVID-19 patients with **hospital acquired bacterial pneumonia**, broad spectrum antibiotic may be prescribed based on national or hospital antibiotic guidelines and on the local epidemiology and resistant patterns.
- Dexamethasone and enoxaparin therapy is not an indication for antibiotic therapy.
- Patients who are started on antibiotics, should be reviewed daily and de-escalated based on culture results whenever possible.
- Limit the duration of antibiotic treatment to the shortest possible (5-7 days)

7. Antibiotic stewardship in severe and critically ill patients with COVID-19 infection in high dependency units (HDU) and intensive care units (ICU).

Nosocomial infections such as ventilator associated pneumonia are common among severe and critically ill COVID-19 patients treated at HDUs and ICUs. Challenges in practicing infection prevention and control measures in these settings and irrational administration of antibiotics has led to rapid spread of hospital acquired pathogens and emergence of multi drug resistant bacteria. These infections are associated with the use of steroids and tocilizumab, complications of prolonged mechanical ventilation, other invasive interventions and have led to widespread use of broad-spectrum antibiotics in the initial stages of COVID-19 disease. Infections due to multidrug resistant organisms have resulted in high mortality rates in COVID-19 critically ill patients. Multi-disciplinary approach (A team consisted of an intensivist / anesthetist, physician, radiologist, chest physician and a microbiologist) in treatment of these patients is essential.

- Early diagnosis of secondary bacterial pneumonia using clinical, radiological (Chest X ray, HRCT), ~~and~~ microbiological investigations (cultures, rapid molecular diagnostics) and inflammatory markers is important. This evidence based approach is very important in patients who were treated with tocilizumab where CRP and procalcitonin may not be reliable.
- Start antibiotics on patients having clinical evidence of secondary bacterial pneumonia / ventilator associated pneumonia or other hospital acquired infection (Catheter associated blood stream infection, catheter associated urinary tract infections) according to the national or hospital guidelines and advise from the microbiology team.
- De-escalation of antibiotics should be done as soon as possible once the culture results are available and careful interpretation of results with the expertise of a microbiologist
- Limit duration of therapy to shortest possible by using clinical assessment, radiological and inflammatory markers and also by utilizing Procalcitonin (if available), to support early stopping of antibiotics if appropriate.
- In patients who are towards the end of life: discuss, agree and document goals and limits of current antimicrobial treatment and further escalation of therapy

8. Other elements of antibiotic stewardship in management of COVID-19 patients

Hospital leadership commitment and accountability

- Antibiotic stewardship program in management of COVID-19 patients is a multidisciplinary approach which involves hospital administration, clinicians, microbiologist, pharmacists, nurses, infection control team and laboratory staff
- Leadership must dedicate necessary human, financial and IT resources to implement stewardship program
- Commitment and accountability of all the categories are needed for proper implementation

Action for policy and practice

- Healthcare professionals should follow national or hospital guidelines on management of COVID-19 patients and should improve their antibiotic prescribing practices
- Preauthorization for prescription of broad-spectrum antibiotics, prospective audits and feedback will minimize irrational prescribing.

Tracking and reporting

- Antibiotic prescriptions for COVID-19 patients should be monitored with regular audits and report back system for improvement
- Continuous surveillance of hospital acquired infections and multi drug resistance in COVID-19 patients to provide feedback for improvement of patient care

Education and expertise

- Provide education and educational resources to patients and families on COVID-19 and convince them that the antibiotics will not be helpful in COVID-19 infection, and it will cause more harm by selecting out antibiotic resistant flora.
- Educate prescribers about adverse reactions from antibiotics, antibiotic resistance, and optimal prescribing.
- Regular training and education of healthcare workers working in COVID-19 treatment units on how to improve infection prevention and control measures

Infection prevention and control measures to minimize cross infection in the management of COVID-19

- Infection prevention and control should go in parallel with the antibiotic stewardship program
- Standard precautions and transmission-based precautions are essential in minimizing cross infections and hospital acquired infections in COVID-19 patients (refer Hospital Infection Prevention & Control Manual, 2nd edition)

References

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