

Opinion

Prescribing of antibiotics and anticoagulants for patients with COVID-19 in Libya

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In addition to the ordinary pharmacists' role in dispensing and ensuring safety and efficacy of drugs, pharmacy profession is also concerning with clinical services towards community through multidisciplinary approach [1]. In this regard, the clinical pharmacy is an area of pharmacy that concerned with the science and practice of rational drug use in which clinical pharmacist provides patient care that optimizes medication therapy and promotes health, wellness and prevention of diseases [2]. During the recent crises of COVID-19 pandemic, the health systems appeared to be weak worldwide. Health care professionals seem to have nothing to present to their COVID-19 infected patients as no effective medications are approved by the World Health Organization (WHO)

yet. Moreover, physicians are worried about the secondary infection for COVID-19 patients, therefore, treatment protocols were designed and mostly applied for critical COVID-19 patients who have been hospitalized in Libya. WHO does not recommend antibiotic therapy or prophylaxis for patients with mild COVID-19 unless symptoms of a bacterial infection exist [3]. This monograph will highlight the widespread use of antibiotics and anticoagulants for COVID-19 patients at Maetiga Hospital in Tripoli, Libya.

Table (1) summarizes the treatment protocol used at the Intensive Care Unit in Maetiga Hospital for patients with COVID-19 during the last few months.

Table (1): Treatment protocol used at the Intensive Care Unit (ICU) in Maetiga Hospital.

Protocol steps	Treatment
First	Low molecular weight Heparin (LMWHs), 25,000 I.U., infusion per 24 hours Oral direct thrombin inhibitors Rivaroxaban 15-20 mg Edoxaban 30-60 mg Diapgran Etexilate 110-150 mg Antiplatelet Aspirin 75-100 mg Clopidogrel 75 mg
Second	Corticosteroids, mostly Methylprednisolon (100-150 I.U)
Third	Antibiotics: azithyromycin, ceftriaxone, cefotaxime, ceftazidime, ciprofloxacin, moxifloxacin, levofloxacin, meropenom, amikacin, imipinam, tazocin, metronidazole, flucazol
Fourth	Supplements: Multivitamines (Vitamin D, Vitamin C) and Zinc

The medical team at isolation unit in Maetiga hospital is trying to help patients to improve the functional performance of the respiratory system and raise the level

of the immune system. So, their focus is on modifying oxygen to its highest possible degree and preventing the development of inflammation as well as preventing

secondary infections that may occur inside the hospital especially in the intensive care unit. Patients admitted to the intensive care unit in the hospital are often transmitted from other Corona Corinthian or from their homes. Upon their arrival, physicians start to manage COVID-19 cases by control vital signs and try to modify oxygen saturation, and withdraw blood for complete analysis. The point of view of physicians in isolation unit at the hospital is to use heparin as a prophylaxis in order to prevent a clot from a COVID-19 patient and methylprednisolone 100-150 mg to reduce mucus production, hypersecretion, airway edema and exudation. Prescribing the third-generation cephalosporin antibiotics as a first line of defense against secondary infection in the hospital, is in accordance to the pneumonia protocol. In the event that the presence of bacterial infections is confirmed, physicians will add another antibiotic, and the main goal is to decrease the rate of inflammation and improve lung function and reduces moderate to severe exacerbations.

The management plan of the clinical pharmacist at the hospital including review the history of medication taken by the patient, follow-up the patient with the other medical team, review the medications prescribed by physicians, review drug-drug interaction, calculate the dosage needed for the patient, and ensure that the patient received a correct treatment and management [4].

From a clinical pharmacist point-view, one can say that for thrombi-prophylaxis dosing in hospitalized or critically ill patients as in the case of COVID-19, it is preferable and recommended to use just low-molecular-weight heparin (LMWH) instead of giving Unfractionated heparin (UF) and oral anticoagulants in the event of no patient's history (MI, DVT, PE) or no secondary infection. In addition to its ease of use, LMWH has a decreased risk in patients with Deep Venous Thrombosis (DVT) and Pulmonary Embolism (PE), and when compared with UF, showed more effective and causes less bleeding [5]. Dose adjustment is the core specialty of a clinical pharmacist. This issue did not put in perspective at Maetiga hospital for medications given to COVID-19 patients. The widespread use of antibiotics (Table 1) for COVID-19 patients without microbiological test makes it almost impossible to decide which is the appropriate antibiotic to give. The Libyan drug market lacks many medicines that would improve recovery cases among patients, forcing physicians to deal with specific drug types, so a clinical pharmacist should be consulted in making the best therapeutic decision to avoid prescribing errors. Furthermore, in dispensing antibiotics

and anticoagulants, an interaction process (drug-drug interaction) may occur which may lead to unwanted complications. With reference to Table 1, it can be seen that this issue is clearly exist. The following are only examples: Azithyromycin may increase the effect of UF by decreasing its metabolism, so, it should be avoided or use an alternative antibiotic, ceftriaxone may increase the effect of UF and warfarin by decreasing Prothrombin Time (PT) activity, and cefotaxime may increase the effect of warfarin by decreasing Vitamin-K which produce intestinal flora and may lead to an increase of the International Normalized Ratio (INR) in few days. It is recommended to regulate the use of N-acetyl cysteine (NAC) and carbocysteine which will reduce the risk of exacerbation in selected patients. Also, antibiotics can shorten recovery time to reduce the risk of relapse and hospitalization duration and may also minimize exacerbation. If exacerbation dose not respond to initial antibiotic, Sputum culture and Sensitivity Test Should be performed.

In order to avoid all the complications mentioned above, as a clinical pharmacist in Maetiga hospital, my opinion is to recommend that the Libyan hospitals are in need to apply the **Stewardship Program** [6]. This coordinated program promotes the appropriate use of medications including antibiotics, improves patient outcomes, and decreases the spread of infections primarily for COVID-19 cases. WHO guidance on the clinical management of COVID-19 incorporates antibiotic stewardship principles with specific recommendations [7].

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