

COVID-19 Rapid Guideline in Kidney Transplant Recipients

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Since in the reports presented about COVID-19, patients receiving kidney transplantation have not been specifically studied and based on national flowchart, this population is classified as high-risk group, thus it is necessary to be aware of the step-by-step treatment approach of these patients.

Suspicious cases included patients with a history of dry cough, chills or sore throat accompanying by shortness of breath with or without fever, patients with upper/lower respiratory symptoms with radiological manifestations as single or double-sided multi-lobular infiltrations on CT scan or plain chest radiography, any one that has a history of close contact with a definite COVID-19 case within the last 14 days, any one with a history of presence in COVID-19 epidemic regions within the last 14 days and patient with pneumonia that despite of proper treatment has an inappropriate clinical response and clinical condition becomes more severe in an unusual way or unexpectedly.

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APPROACH TO KIDNEY TRANSPLANT RECIPIENTS WITH DRY COUGH, CHILLS OR SORE THROAT WITH OR WITHOUT FEVER

- After taking history and performing physical examination if there is shortness of breath or O₂ saturation < 93% or RR > 30/min, the patient should be referred to one of the selected specialized centers in order to hospitalization. In other cases following tests should be requested; CBC (diff), C-Reactive Protein (CRP), serum creatinine.
- In all patients with dry cough, sore throat or chills with or without fever lung HRCT (or if not available: CXR) should be requested (Figure 1).
- In kidney transplant recipient based on the general condition of the patient, the physician can refer him/her to the selected hospital in case of unavailability of performing outpatient CT scan.
- For febrile kidney transplant recipient with normal CXR, in the absence of other

admission indications, lung HRCT should be done. In case of normal CT scan (after taking diagnostic nasopharyngeal swab test) with strict recommendations for home care and quarantine, accompanying by taking hydroxychloroquine / chloroquine and azithromycin; the patient can be discharged after emphasizing the warning signs (shortness of breath, loss of consciousness, drowsiness, cough exacerbation, sputum-added cough, failure to relief fever despite of 5 days treatment).

- Kidney transplant patient with raised serum creatinine level without any radiological involvement, lymphopenia or increased CRP level; could either be admitted in usual nephrology ward for further evaluation of creatinine rise or follow up as out patient case according to the physician s decision.
- In order to ruling out other causes of symptoms, we also recommend to check CMV PCR, urine and blood cultures and immunosuppressant

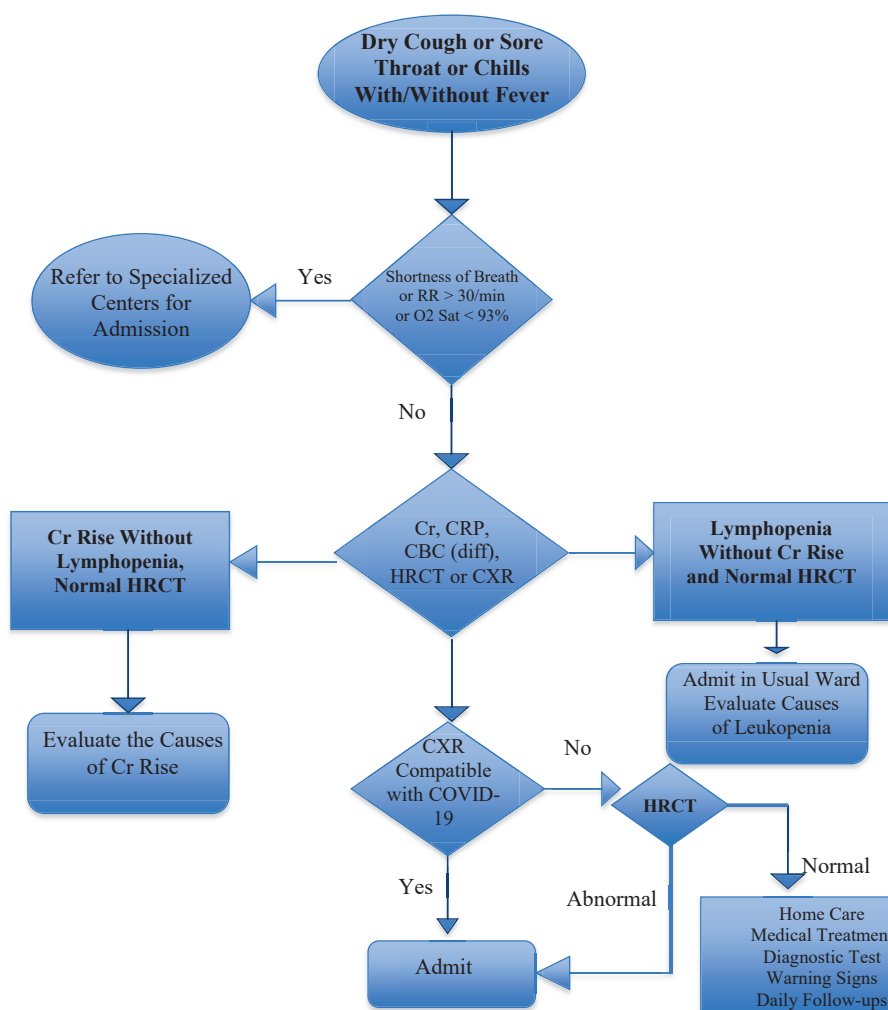


Figure 1. It shows approach to kidney transplant recipients with dry cough, chills or sore throat with or without fever.

- drugs blood level
- Patients with radiological involvement compatible with COVID-19 would be admitted in suspicious patients ward (Figure 2).
- In case of no hypoxemia (O₂ saturation > 93%), with no rise in serum creatinine level, we recommend to discontinue anti metabolites (mTOR inhibitors, mycophenolate mofetil, azathioprine), meanwhile continue with low dose CNIs and stress doses of corticosteroid. In case of no hypoxemia (O₂ saturation > 93%), but with raised serum creatinine level; in addition to above-mentioned measures kidney biopsy may be requested based on the physicians decision. In the presence of rejection evidences, treatment with IVIG 1 to 2 g/kg in divided doses during 5 days is recommended.
- In case of hypoxemia (O₂ saturation < 93%),

besides other evaluations, checking IL-6 serum level, IGRA or PPD test, and procalcitonin level are also recommended. In such a scenario we discontinue anti metabolites (mTOR inhibitors, mycophenolate mofetil, azathioprine) and CNIs as well and continue with high doses of corticosteroid plus IVIG 1 to 2 g/kg, divided doses in 5 days. In case of treatment with Lopinavir/Ritonavir and Atazanavir/Ritonavir, adjust and dose reduction of CNIs should take into consideration due to cytochrome P450 inhibitory effect of these medications. Hence, checking blood level of drugs has been recommended at least every other day. Usually the immunosuppressant drug doses reduced significantly during treatment course, therefore increasing the doses should be kept in mind after the end of antiviral treatment course.

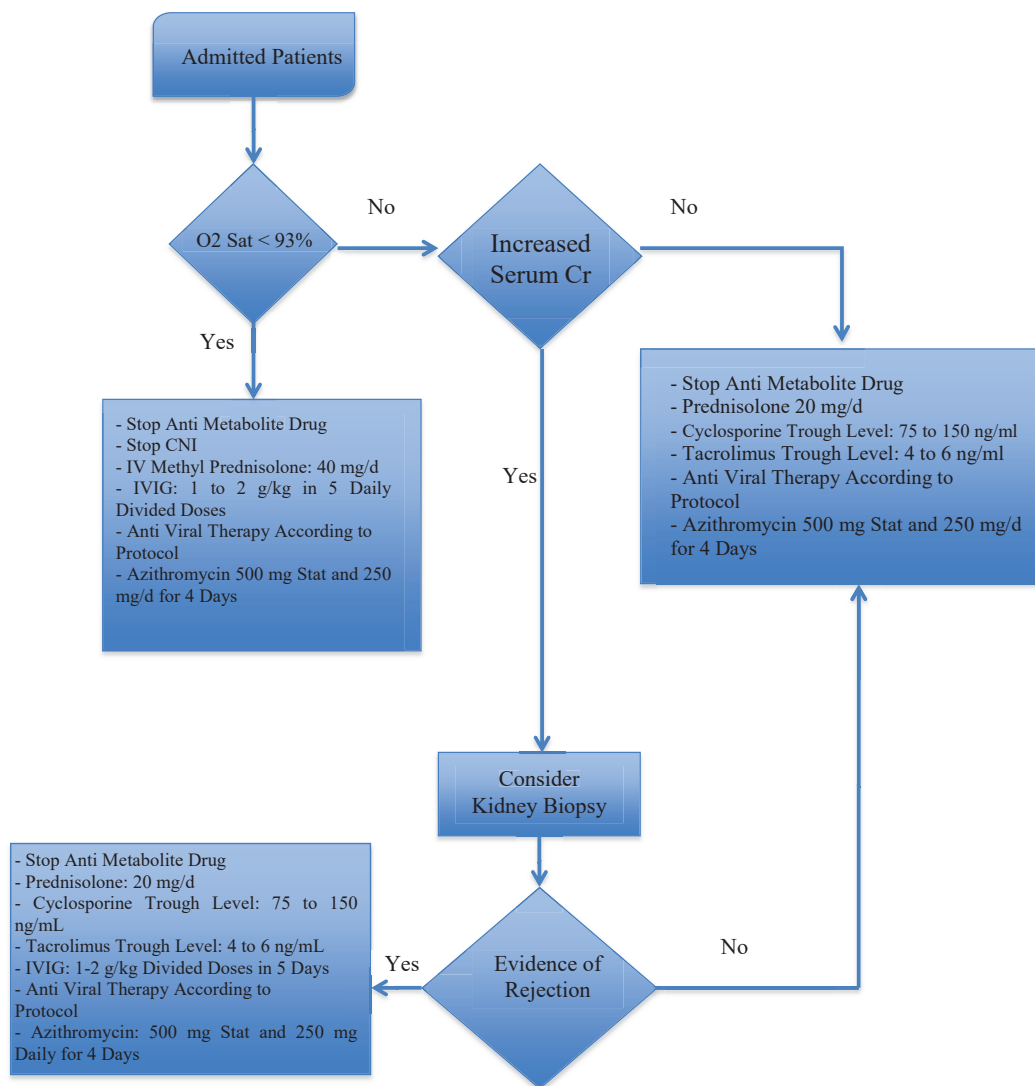


Figure 2. It demonstrates approach to admitted kidney transplant recipients suspicious of COVID-19 infection.

- In hypoxemic patients we consider evaluation of cytokine release syndrome with following lab requests; Hb, WBC, platelet, ferritin, triglyceride, fibrinogen, AST/ALT every other day, IL-6 level, CRP, ESR, D-Dimer, PT, PTT, INR, VBG, P. In cytokine release syndrome, evaluate patients in grade 3 (vasopressor-dependent hypotension or hypoxia despite FIO₂ > 40%) for starting hemoperfusion treatment.
- In following cases hemoperfusion could be recommended with or without CRRT; in refractory vasoplasia (refractory vasoplasia, profound vasoplegia with elevated levels of lactate and high need for vasopressors (e.g. NE > 0.3 µg/kg /min) not responding to standard therapy) and in severe respiratory

distress syndrome if the patient presents with simultaneous AKI, add hemoperfusion on CRRT otherwise perform hemoperfusion alone.

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