



*इस्रुत*  
*लडलकल नडलड*

*August*  
**2020**

Wherever the art of medicine is loved,  
there is also a love of humanity.  
- Hippocrates

**Sushruta Medical News**

A Medical Newsletter of the

**American Association of Physicians of Indian Origin**

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## Invited Editorial

### A Closer Look at Hydroxychloroquine and Zinc in COVID-19

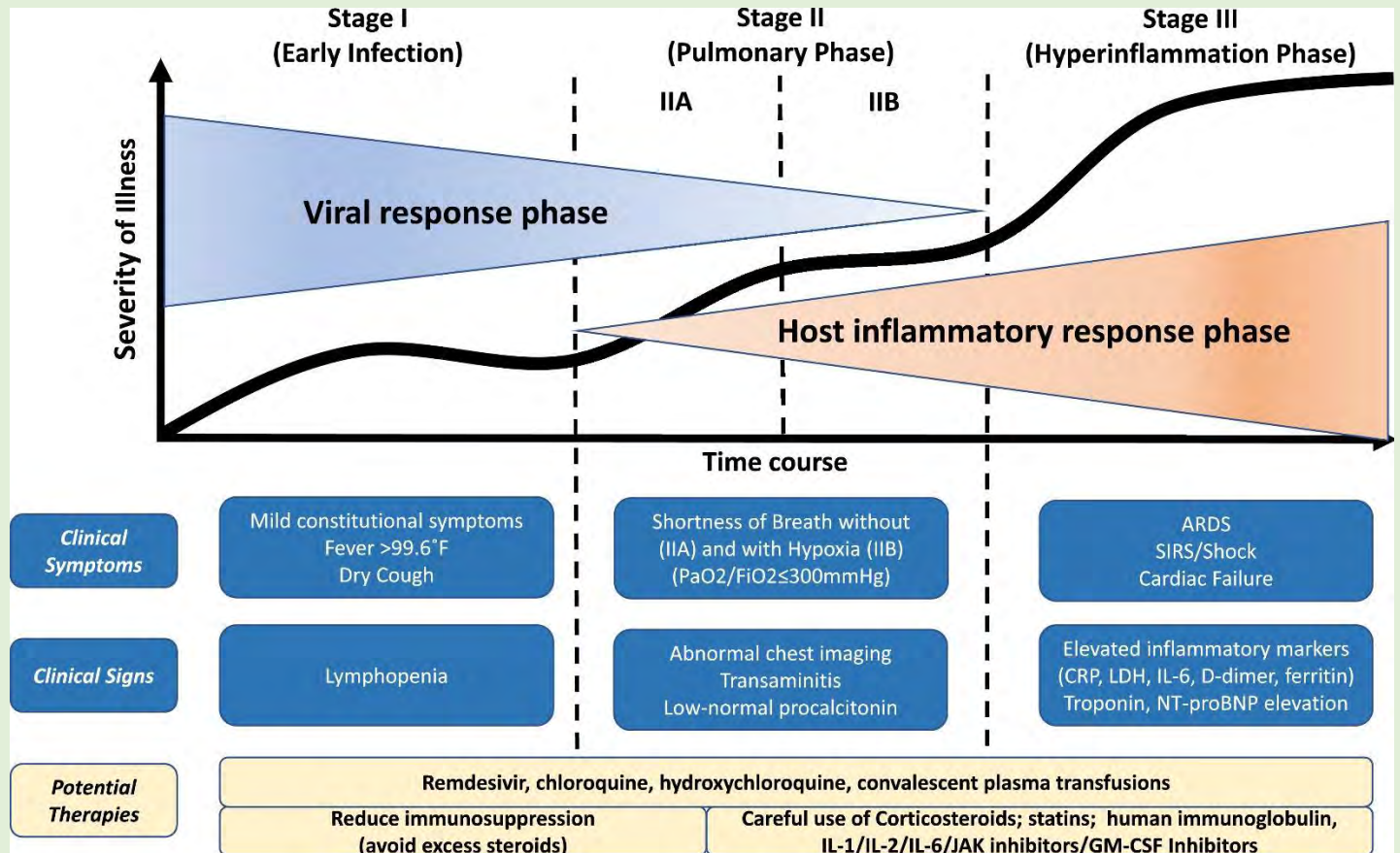
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There has been much debate on the use of hydroxychloroquine in COVID-19 caused by SARS-CoV-2 virus, which is a coronavirus, similar to SARS-CoV and MERS viruses. The debate has been with regard to the potential use of HCQ or lack of it in COVID-19 prevention and/or treatment. Interestingly, the debate extends from practicing clinicians to regulatory agencies to politicians to pharma industry to social media, which generated more heat than light on this subject. As an Emergency Physician who treated several COVID-19 patients, I would like to present my perspective of a closer look at the potential use of HCQ in combination with zinc in COVID-19 disease, as I believe that the final word has not been said with unequivocal evidence.

Coronaviruses are RNA viruses, enveloped in a membrane and proteins. Receptor-mediated endocytosis plays a vital role in viral entry into the host cells. By this process, the entire virus is internalized, and the endocytosed virion, therefore, ends up inside a membrane-bound compartment in the cell (an endosome) from which it must escape for replication. This trafficking and escape process generally depend on the acidification of the endosome and/or fusion with acidic lysosomes. Basic virology studies established that SARS-CoV depends on endosomal escape, that it buds from the Golgi apparatus, and that its receptor (ACE2) is itself glycosylated in the Golgi apparatus. Vincent and colleagues established the efficacy of chloroquine (CQ) in inhibiting SARS-CoV replication and provided evidence that impaired endosomal acidification, as well as impaired ACE2 glycosylation, might be responsible ([Vincent et al, 2005](#)). Hydroxychloroquine (HCQ;  $EC_{50} = 0.72 \mu M$ ) was found to be more potent than CQ ( $EC_{50} = 5.47 \mu M$ ) in vitro. Based on the results of physiologically-based pharmacokinetic (PBPK) models, a loading dose of 400 mg twice daily of HCQ sulfate given orally, followed by a maintenance dose of 200 mg given twice daily for 4 days is recommended for SARS-CoV-2 infection, as it reached 3 times the potency of CQ phosphate when given 500 mg twice daily 5 days in advance ([Yao et al, 2020](#)).

Antiviral effects of HCQ are well-documented (Yang and Shen, 2020). Chloroquine and HCQ have zinc ionophore characteristics, increasing intracellular zinc concentrations (Xue et al, 2014). Zinc inhibits the activity of RNA-dependent RNA polymerase needed for multiplication of coronaviruses (te Velthuis et al, 2010). Thus, administration of zinc may enhance the efficacy of HCQ in treating COVID-19 patients (Derwand and Scholz, 2020). Carlucci and associates have shown that the addition of zinc to HCQ reduces mortality and hastens the recovery if given early in the disease process. But if it is given after the patient is admitted to the ICU, then there is no benefit (Carlucci et al, 2020).



**Figure 1:** Classification of COVID-19 disease states and potential therapeutic targets. The figure illustrates 3 escalating phases of COVID-19 disease progression, with associated signs, symptoms, and potential phase-specific therapies. ARDS, acute respiratory distress syndrome; CRP, C-reactive protein; JAK, janus kinase; LDH, lactate dehydrogenase; NT-proBNP, N-terminal pro B-type natriuretic peptide; SIRS, systemic inflammatory response syndrome; GM-CSF, Granulocyte Macrophage Colony Stimulating Factor. Reprinted from *The Journal of Heart and Lung Transplantation*, vol 39, issue 5, Siddiqi HK and Mehra MR, *COVID-19 Illness in Native and Immunosuppressed States: A Clinical Therapeutic Staging Proposal*, Copyright (2020), with permission from Elsevier. (Siddiqi and Mehra, 2020).

**The COVID-19 disease process is different in stage 1, stage 2, and stage 3.**

**Stage 1:** Early outpatient illness is a viral multiplication problem involving the beginning of the immune response. Hydroxychloroquine and zinc are going to be more effective at this stage.

**Stage 2:** Patients develop mild hypoxemia and are to be admitted to the hospital floor. Oxygen and steroids are going to be the most effective treatment at this stage. Hydroxychloroquine and zinc may be beneficial but are going to be less effective.

**Stage 3:** Patients develop ARDS, Shock, cardiac failure, due to host immune system overreaction called the cytokine storm. Steroids and good ICU care are going to be the best treatment strategy at this stage. Hydroxychloroquine and zinc are not going to be of much use at this stage.

Most infected people are at low risk for progression and recover from stage one without any treatment. Older adults and people with comorbid conditions such as hypertension, diabetes mellitus, cardiac problems, obesity are at increased risk of progressing to stage two and stage three disease. The key to preventing excess death in this group is a safe, effective outpatient treatment initiated at stage one. In other respiratory viral diseases, including influenza, antiviral agents like Tamiflu, are recommended to be given within 48 hours to derive any benefit. Trials using HCQ given in admitted patients in late stages of disease did not show any benefit. It also did not show any significant increase in mortality or cardiac arrhythmias ([Recovery Collaborative Group, 2020](#)).

The conclusion of the study by Boulware and associates that HCQ is not effective in post-exposure prophylaxis does not give the complete picture ([Boulware et al, 2020](#)). There are many flaws in the study, including only 16 patients had PCR confirmed diagnosis of COVID-19, even if we ignore the flaws and take it for granted that the results are accurate. According to the study 11.8% of patients who took HCQ developed COVID-19 and 14.3% of patients who took the placebo developed COVID-19. So the absolute risk reduction of getting COVID-19 is 2.5%. The relative risk reduction by taking HCQ is 17%. It did not achieve statistical significance as the study was powered to detect a 50% relative risk reduction of getting COVID-19. So, anything less than 50% relative risk reduction will lead to a negative conclusion. According to the data, the number needed to treat is 42 to prevent one COVID-19 infection. Of the 414 patients took HCQ, 49 developed symptoms suggestive of COVID-19, and there was one hospitalization and no deaths. None of the 414 patients who took HCQ developed cardiac arrhythmias.

Another study by Skipper and associates published in the Annals of Internal Medicine regarding the treatment of early COVID-19 patients with HCQ has many flaws ([Skipper et al, 2020](#)). The initial primary endpoint in the study was hospitalization and death, which was changed in the middle of the study to overall symptoms severity at the end of 14 days. Of the 212 patients taking HCQ, four patients were admitted to the hospital with the hospital admission rate of 2%. Out of 211 patients in the placebo arm, ten patients were admitted to the hospital with a hospitalization rate of 5%.

The above studies reveal that most patients do not progress to stage two or stage three disease, and so, do not prove that HCQ is ineffective in early COVID 19. Studies should be conducted in high risk patients with multiple comorbid conditions to find a significant benefit of early hydroxychloroquine therapy.

Some studies showed benefits from HCQ therapy when instituted early in the course of disease in hospitalized patients ([Arshad et al, 2020](#)). Another randomized clinical trial from China showed the efficacy of hydroxychloroquine to shorten the time to clinical recovery and prevent progression to severe disease ([Chen et al, 2020](#)). Patients living in long term care facilities have increased risk of progressing to stage two or stage three disease if they get COVID-19. So HCQ prophylaxis may be beneficial in this setting if they are exposed to COVID-19 ([Lee et al, 2020](#)). There was a large outbreak of COVID-19 in a long-term care facility in South Korea. One hundred and eighty-nine individuals living in that long-term care facility and 22 healthcare workers were exposed to the outbreak. All 211 exposed people received HCQ prophylaxis, and none of them developed COVID-19. RT-PCR of nasal swabs was done and was found negative in all 211 people at the end of 14 days.

***Obvious conclusion after the above review and analysis of potential benefits of HCQ administration early in COVID-19 disease warrants further evaluation by rigorous clinical studies in a high-risk population. Hence, the last word has not been uttered unequivocally.***

**Disclosure:** Author declared no competing interests.

**References:** Citations shown in the text are hyperlinks to the corresponding publications.

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# MSRF Longue

**The Accredited Social Health Activist (ASHA) Program as a Facilitator of Behavior Change Amongst Female Villagers in Two Districts in the State of Punjab**

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**This abstract has been adapted from the departmental honor thesis of Dr. Priya Uppal, which was successfully defended and received one of the two the Best Honors Thesis Awards in 2019 from the Jackson School of International Studies, University of Washington.**

**Introduction:** This study explored the efficacy of the Accredited Social Health Activist (ASHA) Program in two districts of Punjab in 2017-2018. The program worked in alignment with socio-cultural norms with the aims of improving maternal and child health. The ASHA facilitated the dissemination of health information amongst her fellow villagers using existing networks of communication which allowed women to live healthy lives and rear healthy children. These abilities I posit can elevate the women by increasing their information capital and allowing them to raise their status in their husband's household through the rearing of healthy children.

**Methods:** In total 37 IRB approved interviews were conducted of female & male villagers over the age of 18 years old including ASHAs, ASHA facilitators, and Auxiliary Nurse Midwives (ANMs) in the village of Mathi in the Fatehgarh Sahib District of Punjab, and a Primary and Community health center in the Ludhiana District. The men and women (non ASHA, ANM, ASHA facilitators) were asked a set of 21 questions, and the ASHAs, ANMs, and ASHA facilitators were asked a set of 22 questions with the assistance of a translator. Deviation from questions was permitted due to the insights further commentary provided. A quantitative and qualitative analysis was conducted of the data collected. The female respondents (non ASHA, ANM, ASHA facilitators) were divided into two groups based on the birth of their children for the purpose of the quantitative analysis. If a woman had given birth to at least one child since the inception of the ASHA program she was included in Group One. Group Two women consisted of women who had all their children prior to the inception of the ASHA program. Group Three included male respondents, and Group Four included the ASHAs, ANMs, and ASHA facilitators.

**Results:** The primary finding was that the ASHA was able to engender trust in the community across all interview groups through a variety of means including her accessibility, ability to physically accompany individuals to the hospital, and through her promotion of health information in the village. This study showed the positive community regard for the ASHAs, and detailed the ways the ASHAs had personally benefited community members.

**Conclusion:** The ASHA program can also be posited as a successful help group (albeit government run) which is an appropriate context to view this initiative composed of women who became voluntary agents of change to enhance their own lives and that of their community members in these two districts. The sampling of respondents was non random so a future study would include a larger respondent pool sampled randomly to draw statistically significant conclusions. The inclusion of more interview sites throughout these districts and observational analyses of the ASHAs interacting with community members would also add valuable information to this preliminary study.



## *Pioneers in Medicine and Healthcare*

### **Late Sanjiv Sam Gambhir, M.D., Ph.D.**

**Virginia and D.K. Ludwig Professor of Cancer Research & Chair of Radiology**

**Director, Canary Center at Stanford for Cancer Early Detection**

**Director, Precision Health and Integrated Diagnostics Center at Stanford**

**Director, Molecular Imaging Program at Stanford**

**Internationally Acclaimed Pioneer in Molecular Imaging**

On July 18, 2020, the world lost an eminent Physician-Scientist and a fine human being – **Sanjiv Sam Gambhir, M.D., Ph.D.** – who was an internationally acclaimed pioneer in Molecular Imaging, which he developed and nurtured as a powerful tool for early detection of cancers. Sadly, Dr. Gambhir succumbed to cancer, the very disease he wanted the medical community to detect at an early stage so that precious lives can be saved. At the time of his death, he was just 57 years old with a brilliant and illustrious career behind and ahead of him. Just a day before his death, on July 17, 2020, Dr. Gambhir was awarded the Dean's Medal, the Stanford School of Medicine's highest honor, for his "revolutionary contributions to biomedicine and to human health." In recognition of his outstanding and unparalleled contributions, the Stanford University established a new professorship, the Sanjiv Sam Gambhir Professorship in Translational Medicine.

Like many other pioneers in medicine, Dr. Gambhir had an unusual background – a physicist-mathematician turned physician-scientist. Added to his diverse academic qualifications, Dr. Gambhir was a visionary who could think well ahead of his time. There are many pioneering works of Dr. Gambhir in imaging technology. One of his versatile technologies was development of PET (Positron Emission Tomography) reporter genes, which helps detection of cancers at very early stages at molecular level. Thus, Dr. Gambhir took PET imaging to the next level. He also pioneered a technique that uses microbubbles which are detectable through ultrasound for use in cancer diagnosis. Dr. Gambhir was credited with development of a novel immunodiagnostic technology by which re-engineered immune cells release a biomarker upon contact with damaged or cancer cells. Dr. Gambhir worked to make government insurance programs reimburse medical providers for these PET imaging technologies, thus ensuring that innovative diagnostic methods he and others developed reach the clinics where they can be used on regular basis. Dr. Gambhir obtained dozens of patents for his innovative technologies, which were licensed and commercialized by several startups. Thus, Dr. Gambhir did not spare any efforts to ensure that game-changing scientific discoveries and innovative technologies reach the clinics, where they save lives. While doing so he proved himself as a multi-faceted genius. His firm belief that focus on late-stage disease results in suboptimal outcomes made him to work relentlessly to develop early diagnostic methods. In 2017 Dr. Gambhir launched the Precision Health and Integrated Diagnostics Center at Stanford. This program, which aims to prevent or stop diseases at an early stage, harnesses interdisciplinary collaborations. Despite his rich and illustrious life in cancer diagnostics, on May 2, 2015 unfortunately Dr. Gambhir lost his teenage son, Milan, to glioblastoma. Relentless efforts by Dr. Gambhir and his colleagues at Stanford could not save Milan, but that only made Dr. Gambhir more determined and focused. **The Indian Medical Community and Diaspora lost a Doctor, who was a Pioneer, Inventor, Entrepreneur and Fighter against Cancer.**



### **Dean's Medal Tribute Video – Sanjiv Sam Gambhir Stanford Medicine**

[https://www.youtube.com/watch?time\\_continue=831&v=c3jIQ13QeqM&feature=emb\\_logo](https://www.youtube.com/watch?time_continue=831&v=c3jIQ13QeqM&feature=emb_logo)



# The Impact of Kidney Disease on COVID-19

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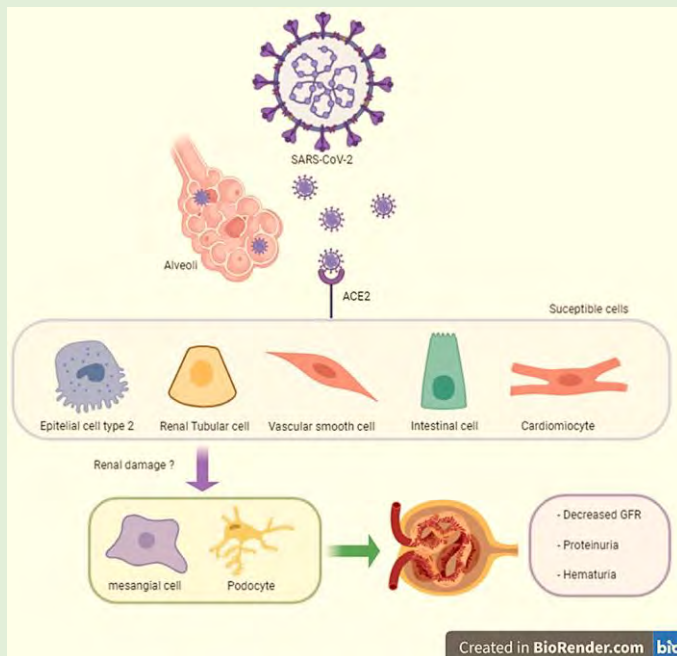
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Although the pathophysiology of COVID-19 mostly involves the respiratory system, and death is often due to Severe Acute Respiratory Syndrome (SARS) associated with cytokine storm, other organs, such as heart and kidney contribute to the overall mortality of COVID-19. Pre-existing conditions, such as obesity, cardiovascular diseases, hypertension, chronic respiratory diseases and cancers have been documented to be associated with higher case fatality rates in COVID-19 ([Wu and McGoogan, 2020](#)). However, when it comes to the kidney, the impact on COVID-19 burden, including mortality rate, is underrecognized. But, kidney can significantly impact COVID-19 burden in different ways as follows.

**Acute Kidney Injury:** SARS-CoV-2 infection can injure the kidney, causing patients to manifest signs of kidney disease, ranging from proteinuria to acute kidney failure that requires dialysis therapy. Reports from China and New York indicated that up to 30% of hospitalized COVID-19 patients developed moderate or severe kidney injury ([Hirsch et al, 2020a](#); [Gupta et al, 2020](#)). Many of these patients have co-morbid conditions, such as diabetes mellitus or hypertension, which increased the risk of kidney injury due to COVID-19. However, some of these patients had no pre-existing kidney conditions. The prevalence of acute kidney injury (AKI) in the USA and Europe was about 20-40% among COVID-19 patients admitted into ICU ([ESICMtv Webinar, 2020](#); [Hirsch et al, 2020b](#)). About 20% of patients admitted to an ICU with COVID-19 require dialysis therapy ([Zhou et al, 2020](#)). In the previous SARS-CoV epidemic, AKI was reported in 6% of the patients, but the mortality rate among those with AKI was 92% ([Chu et al, 2005](#)). Thus, AKI can markedly impact the case fatality rate in Coronavirus infections.



**Figure 1.** SARS-CoV-2 in susceptible cells expressing ACE2 and unknown renal damage. SARS-CoV-2 targets other cells as well, although it often manifests as a respiratory disease.

**From:** D'Marco et al, *Front. Med.*, 06 May 2020 (Open Access) <https://doi.org/10.3389/fmed.2020.00199>

The exact mechanism by which SARS-CoV-2 virus injures the kidney acutely is not clear. It can be multifactorial, with predisposing factors, such as sepsis, hypovolemia, and nephrotoxins. Cardiorenal syndrome secondary to COVID-19 pneumonia, causing right ventricular failure might lead to kidney congestion and AKI. Left ventricular dysfunction might lead to low cardiac output and kidney hypoperfusion due to arterial underfilling. ACE2 (angiotensin converting enzyme-2), the receptor for SARS-CoV and SARS-CoV-2 is heavily expressed on the brush border of proximal tubules and to a lesser extent in podocytes of the glomeruli ([Mizuri and Ohashi, 2015](#); [Ye et al, 2016](#)). ACE2 has physiological roles in the kidney that are beneficial for vascular function and salt and water homeostasis. Data from autopsies showed endothelial damage in the kidney with presence of viral particles in the endothelial cells ([Varga et al, 2020](#)). Autopsies also revealed diffuse proximal tubule injury with the loss of brush border, non-isometric vacuolar degeneration, and even frank necrosis ([Su et al, 2020](#)), as well as collapsing glomerulopathy with leakage of protein in Bowman's capsule ([Larsen et al, 2020](#)). Although the link between the presence of viral particles and the observed pathophysiological alterations in the kidney is not clear, the link between AKI and poor outcomes is well documented ([Adapa et al, 2020](#)).

The other possible mechanisms by which SARS-CoV-2 infection can injure the kidney is decreased oxygen tension in the body due to COVID-19. The kidney, especially at its corticomedullary junction, is very sensitive to low oxygen tension. This is also the part of the kidney that is prone to ischemic-reperfusion injury. By virtue of its anatomy, the capillaries in the outer medulla are vulnerable to occlusion in conditions that lead to vasoconstriction and/or edema. Intravascular clotting associated with COVID-19 may also block smaller blood vessels in the kidney. This causes interference with supply of oxygen and nutrients to the pars recta of the proximal tubules and the thick ascending limb. The epithelial cells of pars recta cannot switch from oxidative to glycolytic metabolism, resulting in injury ([Bonventre and Yang, 2011](#)). The corticomedullary junction of the kidney, where the interstitial cells that produce erythropoietin are localized, is considered as one of the oxygen sensing tissues of the body or *critmeter* ([Donnelly, 2001](#)). By sensing oxygen tension in the blood, kidneys respond acutely by raising the hematocrit through regulation of salt and water content of the blood and sub-acutely by producing erythropoietin. In fact, preliminary epidemiological data has shown that people living at high altitudes (2,500 meters above sea level) might be protected against SARS following infection with SARS-CoV-2. Based on this, it has been suggested that administration of erythropoietin may protect against SARS of COVID-19 ([Soliz et al, 2020](#)). This proposal deserves evaluation in the clinic, although there are no reports that kidneys do not respond well and produce erythropoietin in COVID-19 disease. Cytokine storm may also cause AKI, even in the absence of active viral replication in the kidney. For example in the previous SARS-CoV epidemic, an interferon-gamma-related cytokine storm led to severe organ damage in SARS patients ([Huang et al, 2004](#)). In fact, cytokine-mediated inflammatory AKI is a well-known phenomenon in cancer immunotherapy using interferons or immune-checkpoint inhibitors of chimeric antigen receptor (CAR) T cells ([Parazella and Shirali, 2018](#)).

Whatever may be the mechanism, since kidney function has intricate relations with the functions of other vital organs, such as heart and lungs in regulating oxygen tension and water and electrolytes homeostasis, injury to the kidney can affect the outcome in COVID-19 patients. Patients with kidney injury that do not require dialysis are more likely to recover from COVID-19 than those who require dialysis therapy. In either case, the chances of these patients subsequently developing chronic kidney disease (CKD) and end-stage renal disease (ESRD) are high ([Coca et al, 2012](#)). And AKI is also independently associated with risk for cardiovascular disease and congestive heart failure ([Coca et al, 2012](#)). Thus, AKI during COVID-19 infection has a long-term burden on the health of the patients, even if the patients recover and appear to be in good condition at the time of discharge. Obviously, these patients need closer and long-term monitoring more than those patients that did not manifest kidney diseases due to COVID-19. Thus, the epidemiological data suggest that AKI is one of the main risk factors in the prognosis of COVID-19 with diabetes mellitus as the main renal co-morbidity. In fact, a recently published meta-analysis of data of 3615 COVID-19 patients from 15 observational studies concluded that the presence of AKI, acute liver injury and coagulopathy was associated with poor outcomes ([Lim et al, 2020](#)). In view of this, early recognition of kidney involvement in COVID-19 and use of appropriate preventive and therapeutic measures to limit the severity of AKI are needed to reduce morbidity and mortality, as well as the long-term consequences of AKI ([Ronco et al, 2020](#)). Adequate hydration and ensuring fluid balance right from the time of admission of the patients, without compromising pulmonary function is crucial in addition to renal replacement therapy (RRT), if needed.

**Chronic Kidney Disease:** According to the National Kidney Foundation, an estimated 37 million American adults (1 in 7 adults) suffer from chronic kidney disease (CKD), and approximately 90% of those with CKD do not even know they have it. CKD is more common in women (15%) than in men (12%). CKD is the 9th leading cause of death in the United States, causing more deaths than breast or prostate cancer ([Kidney Diseases: The Basics - NKF](#)). CKD is a silent and non-glamorous disease that steadily progresses to end-stage renal disease (ESRD). Patients with CKD have higher rates of infections, cardiovascular complications, and suffer with chronic inflammation, anemia and lipid abnormalities with accelerated atherosclerosis that are often resistant to statins, associated with an immunosuppressed state as compared to non-CKD patients. Furthermore, cardiovascular complications, the major cause of death in CKD, are often due to non-traditional causes ([Lullo et al, 2014](#)). In fact, the relation of CKD with cardiovascular complications, often termed as “type-4 cardiorenal syndrome” (CRS-4) ([Lullo et al, 2014](#)), characterized by ventricular hypertrophy, diastolic dysfunction, and/or increased risk of adverse cardiovascular events, is increasing the prevalence of this condition and making CRS-4 a major public health problem associated with a high morbidity and mortality ([Clementi et al, 2013](#)). The risk for severe COVID-19 is 3-fold higher in CKD than non-CKD patients. The prevalence of CKD is 12-fold higher in ICU than in non-hospitalized COVID-19 patients ([D’Marco et al, 2020](#)). Furthermore, there is a possibility of development of AKI in CKD patients with SARS-CoV-2 infection ([Wang et al, 2020](#)). A meta-analysis of 34 eligible studies evaluating the comorbidities and risk of severe or fatal outcomes associated with COVID-19 disease identified kidney disease as one of the clinical risk factors of fatal outcomes along with obesity, hypertension, diabetes, cardio-cerebrovascular diseases, respiratory diseases and malignancy ([Zhou et al, 2020](#)). In another meta-analysis



of 22 studies which included 5595 COVID-19 patients with an aggregate case fatality rate of 16%, the prevalence of liver diseases and CKD was 3% and 1%, respectively. However, in patients with liver diseases 57% had severe COVID-19 and 18% mortality rate. In patients with CKD, 84% had severe COVID-19 and 53% mortality rate ([Oyelade et al, 2020](#)). Thus, similar to AKI, CKD markedly impacts the prognosis and mortality rate in COVID-19 disease.

With regard to the management of COVID-19 in CKD patients, the most common problem faced is hypertension, apart from diabetes mellitus. CKD is often associated with hypertension. Several studies revealed that hypertension is a significant and independent risk factor for prognosis and mortality of COVID-19 in CKD patients. However, the relationship between hypertension and COVID-19 is questioned by some researchers. Prevalence of hypertension increases with age, as does the severity of COVID-19 disease with age. After adjustment for age, the association between COVID-19 and hypertension was apparently non-existent ([Li et al, 2020](#)). The second issue, which is also related to the management of hypertension is the suppression of RAS (Renin Angiotensin Aldosterone System) by the use of ACE inhibitors and angiotensin receptor blockers (ARBs). About 15 years ago it has been reported that administration of ACE inhibitors and ARBs increase the expression of ACE2, the receptor for SARS-CoV and SARS-CoV-2 viruses ([Ferrario et al, 2005](#)). This relation led to questioning the wisdom of using ACE inhibitors and ARBs in the treatment of hypertension in COVID-19 patients. However, a comprehensive literature survey of human and animal studies published recently did not find any evidence of ACE inhibitors or ARBs having an effect on ACE2 protein expression ([Sriram and Insel, 2020](#)). More importantly, the position statements issued by the American Heart Association, American College of Cardiology, Heart Failure Society of America, American Society of Nephrology, as well as the Council on Hypertension of the European Society of Cardiology are very clear that the use of ACE inhibitors or ARBs in hypertensive COVID-19 patients should not be discontinued. The simultaneous presence of diabetic kidney disease and diabetic lung in patients with COVID-19 poses challenges to attain optimal glycemic control needed for prognosis and prevention of diabetic ketoacidosis. In order to address these and other challenges in the care of CKD patients with COVID-19 disease, the Canadian Society of Nephrology (CSN) developed the COVID-19 Rapid Response Team (RRT). Based on a nation-wide survey of advanced CKD clinics, the RRT identified 11 broad areas of advanced CKD care management that may be affected by the COVID-19 pandemic ([White et al, 2020](#)).

**End-Stage Renal Disease and Dialysis:** According to the United States Renal Data System (USRDS), in 2017 there were 746,552 patients with end-stage renal disease (ESRD) on maintenance hemodialysis, of which 75,745 were waiting for renal transplantation. Total Medicare costs of CKD and ESRD patients was about \$120 billion (17% of total Medicare spending in 2017). When it comes to ESRD and dialysis, in addition to the problems faced by AKI and CKD in COVID-19 patients as above, there are new challenges. Unlike the AKI or CKD patients, the average age at which a kidney patient enters maintenance hemodialysis program is 64 years. A retrospective study from China on 31 hemodialysis patients reported that these patients have more severe infection and inflammation with less symptoms and worse outcomes ([Zhang et al, 2020](#)). Interestingly, descriptive statistical analysis and report from 13 major dialysis centers in New York health system showed that hospitalized patients on chronic peritoneal dialysis with COVID-19 had a relatively mild course, and majority of them were discharged home ([Sachdeva et al, 2020](#)). A report from two dialysis centers in Mumbai, India revealed that although the clinical presentation and outcomes of COVID-19 in ESRD patients on maintenance hemodialysis in a setting of limited resources mimic the global scenario, unique social and logistic issues are an additional burden to the patients, caregivers and the healthcare facilities, which may worsen the outcomes in the future as the pandemic continues to spread ([Trivedi et al, 2020](#)). The dialysis population is vulnerable and the dialysis facilities are critical in maintaining operations and avoiding disease transmission. This in turn demands leadership, education, preparedness, management and proactive infection control measures on the part of the doctors and staff of the hemodialysis centers or units ([Lee et al, 2020](#)). The goal is to protect the dialysis patients from getting infected without negatively impacting the quality of dialysis and life. This is relevant more so, given the need for maintaining patent vascular access for hemodialysis ([Yang et al, 2020](#)). To avoid COVID-19 transmission among patients on dialysis, major societies of nephrology around the world have provided their guidelines for screening dialysis facilities adjustment and health education ([Li et al 2020](#)). Indisputably, more research needs to be done to evaluate how hemodialysis centers can cater the needs of COVID-19 patients without compromising the quality of health and life of the patients, as well as addressing their personal and family needs and hardship.

**Conclusion:** In short-term, kidney disease can impact COVID-19 mortality and burden. But, in long-term, kidney disease can affect the health of patients that recovered from COVID-19.

**Disclosure:** Author declared no competing interests.

**References:** Citations shown in the text are hyperlinks to the corresponding publications.



## Forgotten Pioneer

August 9, 2020 is the 72<sup>nd</sup> death anniversary of Dr. Yellapragada Subbarow, the first Indian medical graduate to step on American soil much before the Asians were granted immigration rights by the US Congress. Born in a modest family, Dr. Subbarow's mother sold her jewelry to send him to medical school. Working at the Harvard University School of Tropical Medicine, he passed away at a relatively young age of 53 years. Yet, he proved that he deserved more than one Nobel Prize. There was not a single area in the biomedical field – *from megaloblastic anemia to tropical diseases to antibiotics to cancer therapy to metabolic pathways* – which he did not touch and make groundbreaking discoveries. No wonder he was known as the **Miracle Man of Medicine**.

It was aptly said by the American author, Doron K. Antrim: ***You've probably never heard of Dr. Yellapragada Subbarow, yet because he lived you may be well and alive today; because he lived you may live longer.*** Dr. Subbarow never sought limelight and gave interviews to the media. He led a simple life like a *Nishkama Karma Yogi*. **Biography of Dr. Yellapragada Subbarow (1895-1948) by Dr. Pushpa Mitra Bhargava**, former Director, Center for Cellular and Molecular Biology, Hyderabad, India.

<http://medind.nic.in/jac/t01/i1/jact01i1p96.pdf>



Dr. Bhargavi Paruchuri

## नद्वड् रिठल इंदीव

### ISN Community Film Event: 2020 Winner

**Dr. Bhargavi Paruchuri**, Postgraduate student in General Medicine in Dr. Pinnamaneni Siddhartha Institute of Medical Sciences & Research Foundation, Vijayawada, Andhra Pradesh, India, is an enthusiastic and aspiring student. She produced a short film titled **Hope is a Walking Dream** under the mentorship of Dr. B. Varun Kumar and Dr. S. Saritha, Asst Professors of Nephrology. The video is a 3-minute narrative presentation about the life of a patient on dialysis. The video is selected as the Best Video by the **International Society of Nephrology (ISN)** and Dr. Paruchuri is invited for screening of her film in the World Congress of Nephrology 2021 to be held in Toronto, Canada. Sushruta Medical News congratulates Dr. Bhargavi and wishes her the best in her future endeavors. Watch the film at: [https://www.youtube.com/watch?v=UvL6TRKIGrI&feature=emb\\_logo](https://www.youtube.com/watch?v=UvL6TRKIGrI&feature=emb_logo)

# COVID-19 and Diabetes

## ADA + Meta: From the American Diabetes Association

**Meta is a Biomedical Research Discovery Tool** that analyzes & connects millions of scientific outputs to give you a comprehensive view of how your field is evolving. Through its customizable feeds, you can easily follow developments, intersections, and emerging trends in science. **Click on the journal names to access the websites of the publications.**

### **Risk of Severe COVID-19 Disease with ACE Inhibitors and Angiotensin Receptor Blockers: Cohort Study Including 8.3 Million People**

Julia Hippisley-Cox et al, [Heart](#) 2020 Jul 31; heartjnl-2020-317393. doi: 10.1136/heartjnl-2020-317393

### **DPP4 Inhibitors and Respiratory Infection, a Systematic Review and Meta-Analysis of the CardioVascular Outcomes Trials Conducted before the Pandemic and Implications for the Management of Diabetes during COVID-19**

Guillaume Grenet et al, 2020 [MedRxiv](#): the Preprint Server for Health Sciences

### **The Impact of Obesity on COVID-19 Complications: A Retrospective Cohort Study**

Mohamed Nakeshbandi et al, 2020 [Int J Obesity](#), July 28, 2020

### **SARS-CoV-2 and Cancer: Are They Really Partners in Crime?**

Peter A, van Dam et al, 2020 [Cancer Treat Rev](#) 2020 Jul 11;89:102068. doi: 10.1016/j.ctrv.2020.102068.

### **Utility of D-dimer for Diagnosis of Deep Vein Thrombosis in COVID-19 Infection**

Edward S. Cho et al, [J Vasc Surg Venous Lymphat Disord](#) 2020 Jul 29;S2213-333X(20)30420-0

### **Impact of Tocilizumab Administration on Mortality in Severe COVID-19**

A.Tsai et al, 2020 [MedRxiv](#) : the Preprint Server for Health Sciences

### **Predictors of Mortality in Adults Admitted with COVID-19: Retrospective Cohort Study from New York City**

Sridhar Chilimuri et al, 2020 [West J Emerg Med](#) 2020 Jul 8;21(4):779-784. doi: 10.5811/westjem.2020.6.47919

## Call for Contributors

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Previous issues of the **Sushruta Medical News** archived in AAPI website can be read by clicking on the following links.

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## Link to COVID-19 Webinars and CME Lectures in AAPI Website

<https://www.aapiusa.org/covid-19/covid-19-webinars/>



Scan QR Code for the Website

## A One-Stop Website for COVID-19 Information

**Ravi Kolli, M.D.**

**Addiction Medicine/Psychiatry, Monessen, PA**

As we are facing this exploding health care crisis of COVID-19 pandemic and inundated with a constant stream of information and misinformation, it is easy to be confounded and confused. It is not easy to navigate through this rapidly spiraling out landscape and timescale. So my approach to this escalating situation is to inform and educate myself as quickly as I can, while also going through daily clinical, family, social and other responsibilities and obligations. As I started collecting and reviewing as much open source information and data as available, it occurred to me that I should share this curated information with peers who are very busy and engaged in the frontline fighting this battle against COVID-19. So, I dedicated my website [RAVIKOLLIMD.COM](https://www.ravikollimd.com) and redesigned it, posted numerous links to scientific and medical articles and public health resources. As I will be updating the site daily and frequently, I hope you find it of some value and use to you. Please stay safe and well.