

CHLOROQUINE IN SARS-COV-2

When the Corona virus epidemic broke out in December, 2019 in China, scientists were struggling to discover a new drug. Repurposing an old drug was an attractive option because there was no time to develop a new drug from scratch. Early *in vitro* studies showed that chloroquine had fair anti-viral properties at micro-molar concentrations. Immediately trials in sick patients were begun in China and the first paper very briefly stated that early reports in 100 patients seemed favorable.

Then Raoult's group from Marseille, France published their findings in 42 adults of whom 26 received hydroxychloroquine and 16 acted as controls. Patients were of all categories- asymptomatic, upper respiratory infections and pneumonias. Hydroxychloroquine was given in a dose of 200 mg TDS for 10 days. Contraindications for use included G6PD deficiency, long QT syndrome and retinopathy. On the 6th day, 70% of patients treated with hydroxychloroquine were negative for viral testing compared to 12.5% of controls. Of the hydroxychloroquine group, 6 also received azithromycin. All those on the combination were virology negative compared to 57.1% on hydroxychloroquine alone.

There was much criticism of the paper because of the small sample size and some statistical flaws. However, the drug continues to be used in the frontline in some places. In China, chloroquine is used in a dose of 500mg BD for a maximum of 7 days in adults.

Biological plausibility of efficacy of chloroquine is robust. Hydroxychloroquine has a similar mechanism of action. Its advantage is lower toxicity in long term use. *In vitro*, chloroquine has shown efficacy against diverse RNA viruses such as Chikungunya, Dengue, Ebola, Zika etc. It has multiple mechanisms of action. It interferes with the glycosylation of the ACE2 receptor which acts as the entry point for SARS-CoV-2 virus. It interferes with biosynthesis of sialic acid molecules which are used by many of these viruses for production of their receptors. It increases the pH of endosomes. This prevents fusion of the viral particles with the endosome and blocks release into the cytosol. Its role in modulating immune response by inhibiting IL-1, IL-6 and TNF is well known in the field of rheumatology and may play a role in COVID-19 as well.

The ICMR has published guidelines for the prophylactic use of hydroxychloroquine for health care workers and asymptomatic contacts of COVID positive patients (<https://www.mohfw.gov.in>). They suggest a dose of 400 mg on day 1 and 400 mg once a week for 7 weeks for health care workers and 3 weeks in contacts.
(*Int J Microbiological Agents* 20 March 2020)

SURFACE DECONTAMINATION IN THE AGE OF CORONA

Contamination of surfaces is an important route of transmission of SARS-CoV-2. Studies in students have shown that they touch their face upto 23 times per hour. A 5 second touch has been shown to transfer 31.6% of the viral load in certain viruses like Influenza A.

A review of 22 studies found that most coronaviruses can survive on metal, glass and plastic upto 9 days. An experimental study using aerosolized virus sprays found that the virus remains viable on stainless steel and plastic upto 72 hours, whereas it was undetectable on copper after 4 hours and cardboard after 24 hours.

It is recommended to clean commonly touched surfaces with detergent and water or common household bleach (0.1% sodium hypochlorite), which removes the virus in 1 minute. Small surfaces can be cleaned with 80% alcohol or 75% 2-propanol. Other biocidal agents such as 0.05-0.2% benzalkonium chloride or 0.02% chlorhexidine digluconate are less effective.

Tracking the virus on every step of its journey from man to man and blocking its every move is the slow but sure path to redemption.

(*NEJM* 17 March 2020)

HOW BHILWARA KEPT CORONA AT BAY

The origin of the outbreak was a 52-year-old man with severe pneumonia admitted in an ICU in Bhilwara. When he deteriorated he was referred to Jaipur, where he subsequently died. He probably was the source of infection of 17 healthcare workers in a private hospital in Bhilwara. Drastic measures taken by the district officials have managed to prevent rampant spread.

What did they do? A strict curfew was immediately enforced. A door-to-door survey for symptoms was done for 2.5 million people in the city. 6445 people were put in home isolation. Police set up check points in every lane in Bhilwara to enforce curfew. Groceries, milk and medicines were supplied by local authorities *via* control rooms.

Contact tracing of more than 5000 outdoor patients and 600 indoor patients of the hospital that had admitted the index patient was meticulously performed. 42 hospitals were earmarked for COVID-19 positive patients and quarantine facilities for 1550 people in many local hotels were marked out. By early April the burgeoning epidemic seemed under control.

Extraordinary conditions need heroic measures!
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