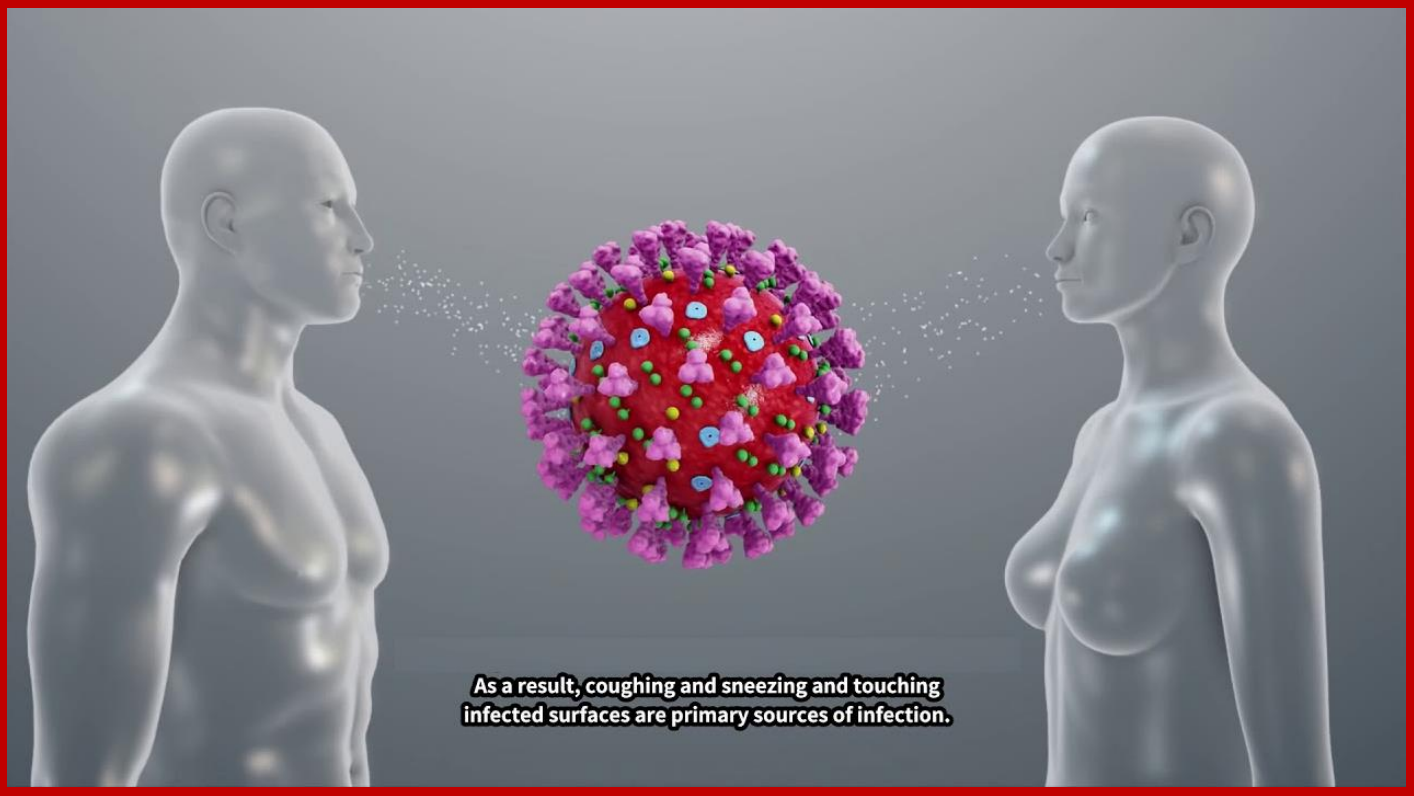
PHARMA HERALD BULLETIN
PHARMACY PROFESSIONALS

The Pandemic Quiz Book

A handy guide from **COLLEGE OF PHARMACY** on understanding the corona virus pandemic and staying protected against COVID-19



Volume 1, April 2020

Editor-in-Chief

DR. ARVIND GUPTA
Principal
Dr. S. N. Dev College of Pharmacy Shamli
(Uttar Pradesh)


#StayHome
StayHomeSaveLives.us
STAY
HOME
SAVE
LIVES

Pharma Herald Bulletin

First Edition: **Volume 1, April 2020**

Editor-in-chief

DR. ARVIND GUPTA

(B.Pharm, M.Pharm, PDCR, M.Sc & Ph.D)

Dr. S. N. Dev College of Pharmacy Shamli (U.P.)

Publishing Partner

1. APTI
Association of Pharmaceutical Teachers of India (U.P.)
Lucknow Uttar Pradesh
Email: upapti@gmail.com
Mobile No: 09198564284
Tel No: 0522-4095748

2. The Association of Young Pharma Professionals
Address:- Noida (U.P.)
Phone No:- +91- 9634308658
Email id:- bhragunandan2112@gmail.com
Website:- http://www.aypponline.in

3. lms.innovesen (The Pharma Research Journal)
Address: office: 842 krishan ganj, Hapur, U.P.
Phone No:- +91- 9917053824
Website:- https://lms.innovesen.co.in

Preface

The aim of this bulletin is to delineate the essential information about medicine and human disease. In the first volume of this bulletin, we have discussed aware that India is facing an extraordinary challenge to protect its citizens from the rapidly spreading COVID-19 pandemic all around the globe. It is a time of demand to do efforts against this pandemic, demands the contribution of youth to act against the spread of COVID-19 across India. The technical education community in the country is well-capable of serving the humanity by utilizing the knowledge and resources.

We have a great responsibility of not only making the people aware of precautionary measures but also to provide a solution or helping hand to strengthen the Government, peoples and School Children in combating the COVID-19.

I hope this manageable Bulletin would serve to provide unique information for COVID 19 prevention, progression and control. My sincere thanks are due to my colleagues for their valuable comments and suggestions.

Dr. A. K. Gupta

Dedicated

to

COVID 19 Fighters

Bulletin useful for COVID-19 Prevention and Control in School going Children

The purpose of this document is to provide clear and actionable guidance for safe operations through the prevention, early detection and control of COVID-19 in schools and other educational facilities. The guidance, while specific to countries that have already confirmed the transmission of COVID-19, is still relevant in all other contexts. Education can encourage students to become advocates for disease prevention and control at home, in school, and in their community by talking to others about how to prevent the spread of viruses. Maintaining safe school operations or reopening schools after a closure requires many considerations but, if done well, can promote public health Pharmacy professional provides the latest guideline for prevention of COVID-19. Another purpose of this documents to aware the school student (CBSE/ICSE/State Board) this disease. This Bulletin provides the latest information regarding the treatment of various diseases.

Every 15 days interval bulletin gives the important information to all connected candidates of various fields. Bulletin invites the entire professional those share your valuable experience regarding the better future of Students. This bulletin also provides the important role in methodology transfer in various fields of education. Bulletins give the carrier guidance to all students, those studied in different School/ College of India.

CONTENTS

1. Introduction

A new pathogen, identified as a novel corona virus (SARS-CoV-2), triggered a new outbreak of pneumonia (COVID-19) in December 2019, starting in Wuhan, China, and is rapidly spreading to 31 provinces in China and over 199 countries all over the world. SARS-CoV-2 is a beta corona virus and shares the genetic sequence and viral structure with the acute respiratory syndrome corona virus (SARS-CoV; 70% similarity), which caused 349 deaths in 2002-2003 in China and Middle East. April 24, 2020, a total of 2,800,999 confirmed cases of COVID-19 had been reported, including 195,215deaths in all over the world. An increasing number of COVID-19 cases have also been reported in the United States, Spain, Germany, Iran, Japan, South Korea and Italy.

The virus is now known as the severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). The disease it causes is called corona virus disease 2019 (COVID-19). In March 2020, the World Health Organization (WHO) declared the COVID-19 outbreak a pandemic.Public health groups, including the U.S. Centers for Disease Control and Prevention (CDC) and WHO, are monitoring the pandemic and posting updates on their websites. These groups have also issued recommendations for preventing and treating the illness.

2. What are corona viruses?

Corona viruses are a large family of viruses with some causing less severe common cold to more severe diseases such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS). The SARS-CoV-2 is a corona virus very similar to the one that caused SARS.

Many corona viruses are zoonotic, meaning they are transmitted from animals to humans.

While the SARS corona virus is thought to be an animal virus from an as-yet-uncertain animal reservoir, perhaps bats, that spread to other animals (civet cats) and first infected humans in the Guangdong province of southern China in 2002, the MERS corona virus was passed on from dromedary camels to humans in Saudi Arabia in 2012.There is evidence that the SARS-CoV-2 has also been transmitted from bats.

3. Structure of Corona Virus

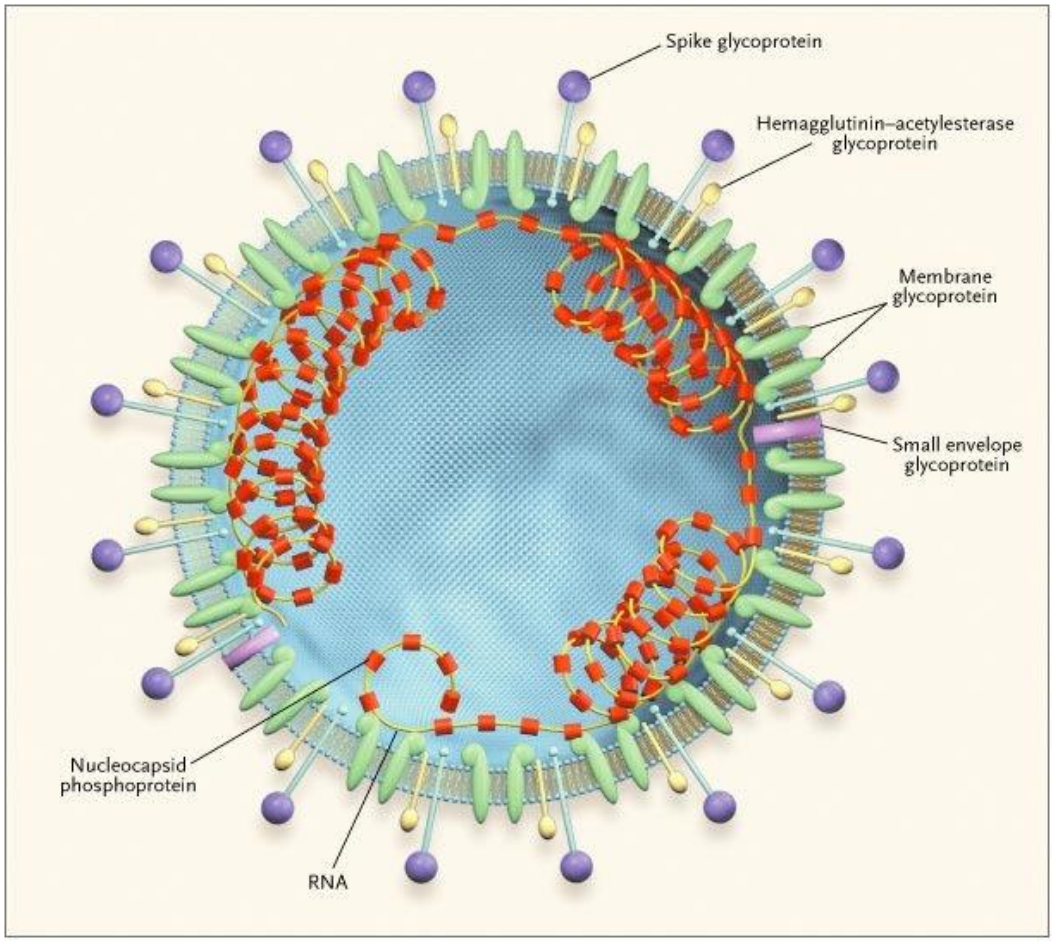
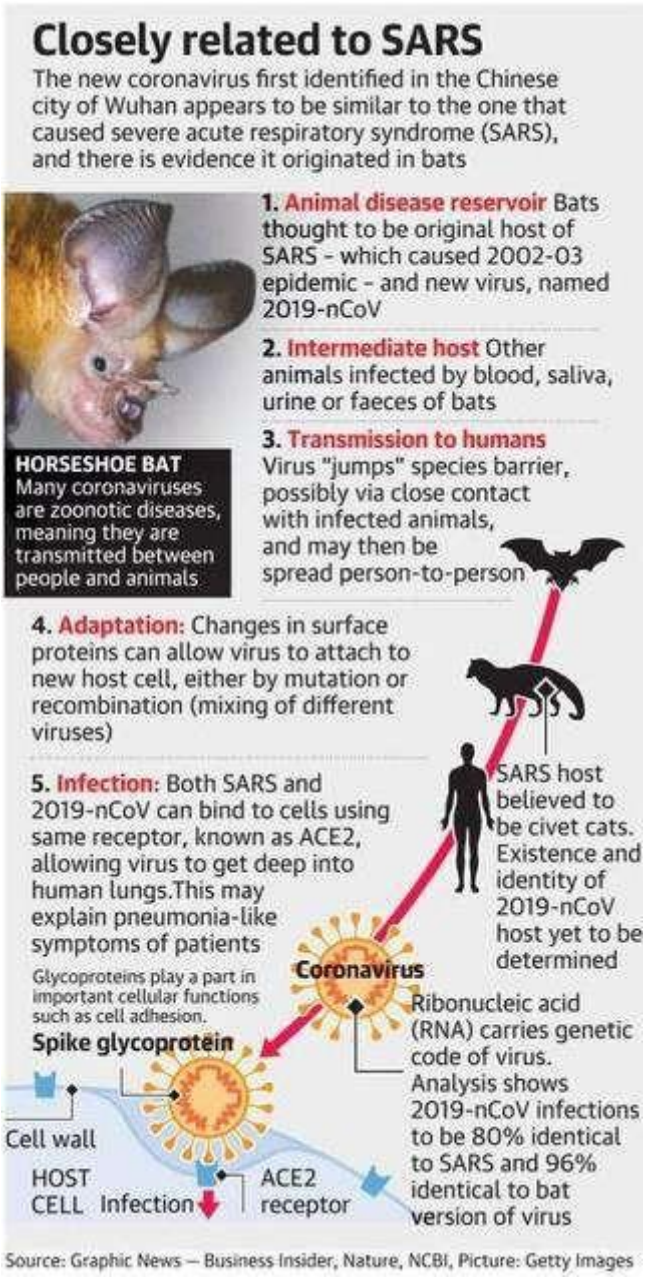


Figure 3.1 Structure of the Corona virus Virion.

Like other corona viruses, SARS-CoV-2 virus particles are spherical and have mushroom-shaped proteins called spikes protruding from their surface, giving the particles a crown-like appearance. The spike binds and fuses to human cells, allowing the virus to gain entry.

Researchers at the University of Texas at Austin and the National Institutes of Health, U.S., have produced a 3D atomic scale map of the protein of the SARS-CoV-2 that binds to and infects human cells. Mapping the 3D structure of the protein — spike (S) glycoprotein will allow better understanding of how the virus binds to the human cells. Knowing the structure of the spike protein will, in turn, allow scientists to develop vaccines and antivirals against the virus and even better diagnostics.

The spike protein of the novel corona virus shares 98% sequence identity with the spike protein of the bat corona virus, the researchers say. The results were published in the Journal Science.



Similar yet different

The researchers also found that like in the case of the SARS corona virus, the spike protein of the SARS-CoV-2 that causes Corona virus Disease 19 (COVID-19) 2 binds to the cellular receptor called angiotensin-converting enzyme 2 (ACE2), which serves as the entry point into human cells. But unlike in the case of SARS, the spike protein of the novel corona virus binds to the cell receptor with much higher affinity (10- to 20-fold) higher.

3.1 High transmissibility

The much greater binding affinity to the cell receptor explains the apparent high human-to-human transmissibility of the virus compared with the SARS corona virus.

"The high affinity of the 2019-nCoV S for human ACE2 may contribute to the apparent ease with which the 2019-nCoV can spread from human-to-human," the researchers reported. "Additional studies are needed to investigate this possibility."

Since both the SARS corona virus and the 2019 novel corona virus share structural similarity and bind to the same receptor, the researchers tested three monoclonal antibodies specific to SARS virus for their ability to bind to the novel corona virus. But none of the three antibodies tested were found to be effective in inhibiting the novel corona virus from binding to the human receptor ACE2 and does prevent or treat the disease.

3.2 Spike structure

However, the 3D map of the S protein will help researchers design new antivirals to stop the virus from binding and infecting human cells. "Knowing the atomic-level structure of the 2019-nCoV spike will allow for additional protein engineering efforts that could improve antigenicity and protein expression for vaccine development," the researchers reported.

The researchers were able to determine the structure of the spike protein as the Chinese researchers shared the whole genome sequence data in the global database.

3.3 Genome sequencing

When the entire genome is sequenced, it helps researchers understand the arrangement of the four chemical entities or bases that make up the DNA or RNA. The differences in the arrangement of the bases make organisms different from one another. Sequencing the genome of SARS-CoV-2 will help us understand where the virus came from and how it spread. For instance, by sequencing the genome of the virus isolated from an Indian patient, it will become possible to know if the virus had come from China or any other country.

In India, the Pune-based National Institute of Virology (NIV) has sequenced the SARS-CoV-2 genome collected from two patients in Kerala.

4. Understanding the disease

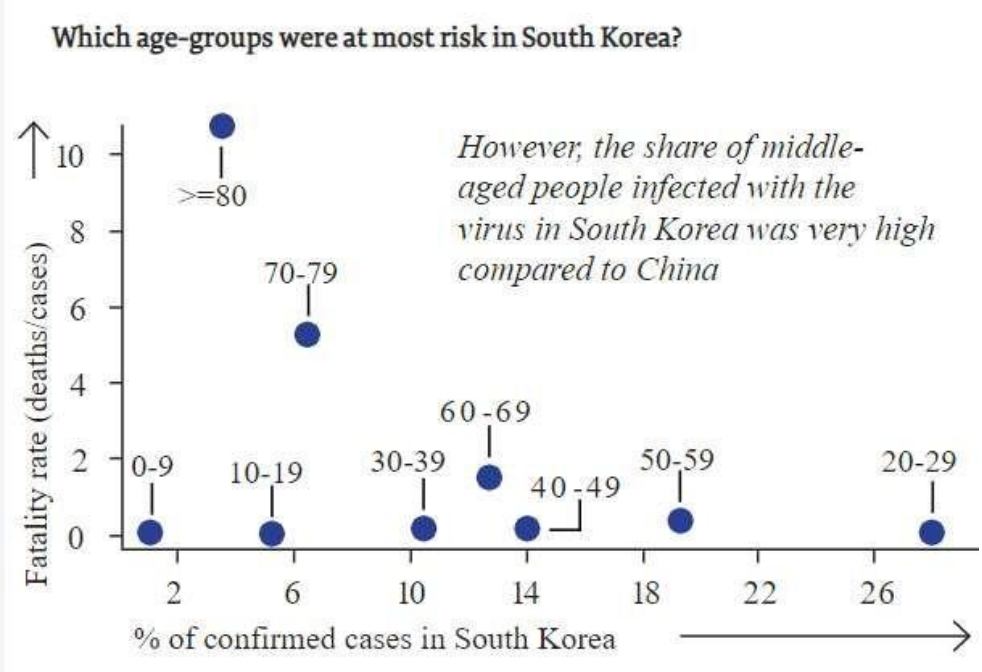
The World Health Organisation has declared COVID-19 to be a pandemic. The symptoms of COVID-19 appear within 2 to 14 days after exposure and include fever, cough, a runny nose and difficulty in breathing.

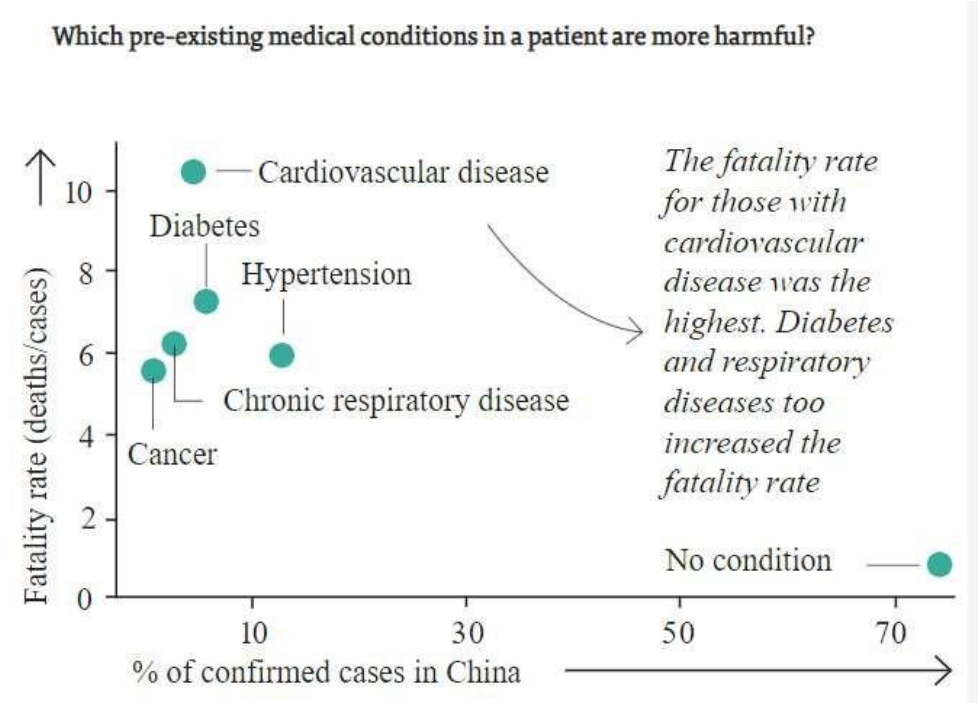
4.1 How does the disease spread?

It primarily spreads through the respiratory droplets of infected people. If a person touches a surface or object that has been infected by the virus and then touches his own mouth, nose, or eyes, he may get infected.

4.2 Who is affected?

While people of all ages can be affected by the disease, people aged 60 and above are at the highest risk of dying due to COVID-19, according to case records analysed by the Disease Control and Prevention Centers in China and South Korea. Victims of the virus with pre-existing medical conditions such as cardiovascular disease and diabetes have a higher fatality rate than others. Also the rate of fatalities was relatively higher for retirees.





Data visualisations by Vignesh Radhakrishnan and Sumant Sen

4.3 What are the sign and symptoms?

As per the guidelines, "COVID–19 may present with mild, moderate, or severe illness; the latter includes severe pneumonia, ARDS [Acute Respiratory Distress Syndrome], sepsis and septic

shock." Signs and symptoms of COVID-19 may appear 2 to 14 days after exposure and can include:

- Fever
- Cough
- Shortness of breath or difficulty in breathing

Other symptoms can include:

- Tiredness
- Aches
- Runing nose
- Sore throat
- Some people have experienced the loss of smell or taste.

The severity of COVID-19 symptoms can range from very mild to severe. Some people may have no symptoms at all. People who are older or who have existing chronic medical conditions, such as heart disease, lung disease or diabetes, or who have compromised immune system may be at higher risk of serious illness. This is similar to what is seen with other respiratory illness, such as influenza.

If you have emergency COVID-19 signs and symptoms, such as trouble breathing, chest pain or pressure, confusion, or blue lips or face, seek care immediately.

If you have respiratory symptoms but you are not and have not been in an area with ongoing community spread, contact your doctor or clinic for guidance. Let your doctor know if you have other chronic medical conditions, such as heart disease or lung disease. As the pandemic progresses, it's important to make sure health care is available for those in greatest need.

4.4 Complications

Although most people with COVID-19 have mild to moderate symptoms, the disease can cause severe medical complications and lead to death in some people. Older adults or people with existing chronic medical conditions are at greater risk of becoming seriously ill with COVID-19.

Complications can include:

- Pneumonia in both lungs
- Organ failure in several cases

4.5 How can it be detected?

The virus can be detected using a RT-PCR test. An RT-PCR or reverse transcription polymerase chain reaction test is DNA-based and can quickly tell if someone harbours the virus. In India, the government facilities to test for the virus include 52 labs belonging to the Viral Research and Diagnostic Laboratories network of the Indian Council of Medical Research (ICMR), 10 labs under the National Centre for Disease Control (NCDC), and the NIV.

4.6 What is the treatment?

There is no current evidence from randomised controlled trial to recommend any specific treatment for suspected or confirmed COVID- 19 patients. No specific anti-virals are recommended for treatment of those suffering from respiratory ailment due to lack of adequate evidence from medical literature.

In India, the Union Health Ministry guidelines has recommended use of anti-HIV drug combinations Lopinavir and Ritonavir on a case-to- case basis depending upon the severity of the condition of a person having corona virus infection. The Ministry recommended Lopinavir-Ritonavir for high-risk groups: patients aged above 60, suffering from diabetes mellitus, renal failure, chronic lung disease and are immuno-compromised.

However, the use of Lopinavir-Ritonavir in PEP regimens for HIV is also associated with significant adverse events which many times leads to discontinuation of therapy.

The guidelines advise the treating doctors to closely monitor patients with severe acute respiratory infection for signs of clinical deterioration, such as rapidly progressive respiratory failure and sepsis, and apply supportive care interventions immediately.

"Application of timely, effective, and safe supportive therapies is the cornerstone of therapy for patients that develop severe manifestations of COVID-19," it said.

4.7 Can a vaccine be developed for COVID-19?

According to Raman. R. Gangakhedkar, head of the Epidemiology and Communicable Diseases-I (ECD-I), Division of ICMR, there are two ways of going for vaccine preparation — either you look at the sequences of the gene which then may lead to development of antibodies, or you actually have the strain and then you try to develop a vaccine which is always an easier option. He said Indian scientists have managed to successfully isolate the COVID-19 virus and about 11 isolates are available which is a prime requisite for doing any kind of research related to viruses and developing the vaccine.

Internationally, several institutes and pharmaceutical companies are in various stages of developing the vaccine with some set to go on clinical trials soon.

5. Protecting yourself against COVID-19

Although there is no vaccine available to prevent infection with the new corona virus, you can take steps to reduce your risk of infection. WHO and CDC recommend following these precautions for avoiding COVID-19:

- Avoid large events and mass gatherings.
- Avoid close contact (within about 6 feet, or 2 meters) with anyone who is sick or has symptoms.
- Keep distance between yourself and others if COVID-19 is spreading in your community, especially if you have a higher risk of serious illness.
- Wash your hands often with soap and water for at least 20 seconds, or use an alcohol-based hand sanitizer that contains at least 60% alcohol.
- Cover your mouth and nose with your elbow or a tissue when you cough or sneeze. Throw away the used tissue.
- Avoid touching your eyes, nose and mouth.
- Avoid sharing dishes, glasses, bedding and other household items if you're sick.
- Clean and disinfect high-touch surfaces daily.
- Stay home from work, school and public areas if you're sick, unless you're going to get medical care. Avoid taking public transportation if you're sick.

The CDC recommends wearing cloth face coverings in public places, such as the grocery store, where it's difficult to avoid close contact with others. It's especially suggested in areas with ongoing community spread. This updated advice is based on data showing that people with COVID-19 can transmit the virus before they realize they have it. Using masks in public may help reduce the spread from people who don't have symptoms. Non-medical cloth masks are recommended for the public. Surgical masks and N-95 respirators are in short supply and should be reserved for health care providers.

If you have a chronic medical condition and may have a higher risk of serious illness, check with your doctor about other ways to protect yourself.

5.1 Social distancing

The WHO says that you should maintain at least 1 metre (3 feet) distance between yourself and anyone who is coughing or sneezing.

This is because when someone coughs or sneezes they spray small liquid droplets from their nose or mouth which may contain virus. “If you are too close, you can breathe in the droplets, including the COVID-19 virus if the person coughing has the disease,” says the WHO.

6. Medicines used for COVID-19 infection in all over the world

A. It is reported that various drugs belongs to the category of Antiviral, Antimalarial, Anti-HIV, Antibiotic macrolides and Anti-rheumatic drugs are the treatment of Covid -19.

1. Antiviral agents: Baloxavir, Remdesivir, Oseltamivir

2. Antimalarial: Chloroquine Phosphate, Hydroxychloroquine (Plaquenil®)

3. Anti HIV drug: Lopinavir and Ritonavir

4. Antibiotic Macrolides: Azithromycin

5. Anti-Rheumatic drug: Sarilumab, Tocilizumab

6. Anti-Parasitic drug: Ivermectin

B. Supporting agents can be used in the treatment of covid-19

1. *Vitamin:* Vitamin C (Ascorbic acid)

***2.* Steroids:** Methylprednisolone

3. Vasodilating agent: Nitric oxide (inhaled)

4. Immunosuppres-sive agent (mTOR inhibitor): Sirolimus

5. Non-steroidal Anti-inflammatory Agents (NSAIDS): Indomethacin

6. Chemical salt: Ammonium Chloride

C. Herbal drugs can be used in the Pre and post infection with allopathic treatment of covid-19

1. Oreganooil (Origanumvulgare)
2. Basil (Tulsi)
3. Fennel
4. Garlic
5. Echinacea
6. Peppermint
7. Sambucus
8. Licorice
9. Astragalus
10. Ginger
11. Ginseng
12. Dandelion
13. Clove
14. Black pepper
15. Ephedra
16. Dioscorea etc.

7. Disinfectant

WHO-recommended hand rub formulations

Suggested composition of alcohol-based hand rub formulations for local production.

1. Hand Sanitizers

Formulation I: To produce final concentrations of ethanol 80% v/v, glycerol 1.45% v/v, hydrogen peroxide (H_2O_2) 0.125% v/v.

Pour into a 1000 ml graduated flask:

S. No.	Chemical Name	Quantity taken
1.	Ethanol 96% *v/v*,	833.3 ml
2.	H_2O_2 3%,	41.7 ml
3.	Glycerol 98%,	14.5 ml
4.	Sterile distilled or boiled cold water	Up to 1000 ml

Note:- Top up the flask to 1000 ml with distilled water or water that has been boiled and cooled; shake the flask gently to mix the content.

Formulation II : To produce final concentrations of isopropyl alcohol 75% v/v, glycerol 1.45% v/v, hydrogen peroxide 0.125% v/v:

Pour into a 1000 ml graduated flask:

S. No.	Chemical Name	Quantity taken
1.	Isopropyl alcohol (with a purity of 99.8%),	751.5 ml
2.	H_2O_2 3%,	41.7 ml
3.	Glycerol 98%,	14.5 ml
4.	Sterile distilled or boiled cold water	Up to 1000 ml

Note:- Top up the flask to 1000 ml with distilled water or water that has been boiled and cooled; shake the flask gently to mix the content.

Only pharmacopoeial quality reagents should be used (e.g. *The International Pharmacopoeia*) and not technical grade products.

Method for local production

Volume of production, containers

- **10-litre** preparations: glass or plastic bottles with screw threaded stoppers can be used.
- **50-litre** preparations: large plastic (preferably polypropylene, translucent enough to see the liquid level) or stainless steel tanks with an 80 to100 litres capacity should be used to allow for mixing without overflowing.

The tanks should be calibrated for the ethanol/isopropyl alcohol volumes and for the final volumes of either 10 or 50 litres. It is best to mark plastic tanks on the outside and stainless steel ones on the inside.

Preparation

1. The alcohol for the chosen formulation is poured into the large bottle or tank up to the graduated mark.
2. H_2O_2 is added using the measuring cylinder.
3. Glycerol is added using a measuring cylinder. As the glycerol is very viscous and sticks to the walls of the measuring cylinder, it can be rinsed with some sterile distilled or cold boiled water to be added and then emptied into the bottle/tank.
4. The bottle/tank is then topped up to the corresponding mark of the volume (10-litre or 50-litre) to be prepared with the remainder of the distilled or cold, boiled water.
5. The lid or the screw cap is placed on the bottle/tank immediately after mixing to prevent evaporation.
6. The solution is mixed by gently shaking the recipient where appropriate (small quantities),or by using a wooden, plastic or metallic paddle. Electric mixers should not be used unless “EX” protected because of the danger of explosion.
7. After mixing, the solution is immediately divided into smaller containers (e.g. 1000, 500 or 100 ml plastic bottles). The bottles should be kept in quarantine for 72 hours. This allows time for any spores present in the alcohol or the new or re-used bottles to be eliminated by H_2O_2.

Precaution:

- For external use only
- Avoid contact with eyes
- Keep out of reach of children

Use: apply a palmful of alcohol-based handrub and cover all surfaces of the hands. Rub hands until dry. Flammable: keep away from flame and heat.

Procedure to participate in Quiz Programme

1. Download the booklet in your mobile.

2. Take A4 size plain sheet.

3. Write the Question and answer in same pattern given in booklet.

4. Tick the correct answer.

5. Write the detail of candidate:

a. Name of Candidate:
b. Class:
c. Roll No.:
d. School/ college Name
e. Address of School/ College:
f. Student Mobile No.

Note:- Make the pdf of your answer sheet and send via email to head office. If you give the all correct answer you will receive E- Certificate copy in your mobile phone or email id.

OR

For online Submission:

Fill form online at https://lms.innovesen.co.in

OR

Fill form online at http://www.aypponline.in

OR

Download the Moodle app in your mobile phone from play store and fill the site https://lms.innovesen.co.in

Introduction, Prevention and Progression Quiz for COVID -19

1. What is the meaning of CO in COVID -19 term?

A. Corona ☐

B. Disease ☐

C. Virus ☐

D. Pneumonia ☐

2. Which is used for Clean and disinfect school buildings, classrooms and especially water and sanitation facilities?

A. Ethyl alcohol 70% ☐

B. Sodium hypochlorite at 0.5% ☐

C. Dettol Liquid ☐

D. $KMNO_4$ ☐

3. Most persons with COVID-19 will experience the sign and symptoms:

A. Fever (83–99%) ☐

B. Shortness of breath (31–40%) ☐

C. Sputum production (28–33%) ☐

D. All of the above ☐

4. According to the illness severity for Critical patients with COVID-19 will experience the:

A. Respiratory failure ☐

B. Shock ☐

C. Multiorgan system dysfunction ☐

D. All of the above ☐

5. Diagnosis of COVID-19 requires detection of SARS-CoV-2 RNA by:

A. Nasopharynx samples ☐

B. Lower respiratory samples ☐

C. Stool and blood ☐

D. All of the above ☐

6. Many corona viruses are zoonotic, meaning they are transmitted from:

A. Water to humans ☐

B. Animals to humans ☐

C. Human to humans ☐

D. Air to humans ☐

7. There is evidence that the SARS-CoV-2 has also been transmitted from bats:

A. Dogs ☐

B. Fish ☐

C. Bats ☐

D. Elephant ☐

8. Why SARS-CoV-2 virus having the name Corona on the basis of structure appearance?

A. Spherical-like ☐

B. Crown-like ☐

C. Cat-like ☐

D. None of the above ☐

9. Which protein of human cell bind with the of Corona virus?

A. Keratin (K) Protein ☐

B. Lipo protein ☐

C. Spike (S) glycoprotein ☐

D. Nucleo protein ☐

10. Which Cellular receptor serves as the entry point of corona virus into human cells?

A. Polymerase ☐

B. Isozymes ☐

C. Dehydrogenase ☐

D. Angiotensin-converting enzyme2 (ACE2), ☐

11. In India, the Pune-based National Institute of Virology (NIV) has sequenced the SARS-CoV-2 genome collected from two patients:

A. U.P. ☐

B. Kerala ☐

C. Delhi ☐

D. Haryana ☐

12. Greater risk of becoming seriously ill patient with COVID-19 include:

A. Tiredness ☐

B. Pneumonia in both lungs ☐

C. Sore throat ☐

D. Fever ☐

13. How many days' symptoms will appear after exposure with COVID-19?

A. Within 4 to 10 days ☐

B. Within 2 to 12 days ☐

C. Within 2 to 14 days ☐

D. Within 5 to 15 days ☐

14. The virus can be detected using a test:

A. MERS ☐

B. NAUT ☐

C. RT-PCR ☐

D. None of the above ☐

15. Which is/are the most necessary things for precautions for avoiding COVID-19 according to WHO and CDC?

A. Wash your hands regularly ☐

B. Cover your mouth and nose ☐

C. Social distancing ☐

D. Avoid sharing dishes ☐

16. Which antimalarial drug commonly used for treatment of COVID-19?

A. Oseltamivir ☐

B. Azithromycin ☐

C. Ritonavir ☐

D. Hydroxychloroquine ☐

17. Which Vitamin helps to fight with Corona virus?

A. Vitamin D ☐

B. Vitamin C ☐

C. Vitamin E ☐

D. Vitamin K ☐

18. Which herbal oil used to treat sore throat in Corona virus infected patient?

A. Fennel oil ☐

B. Pudina oil ☐

C. Clove oil ☐

D. Ephedra oil ☐

19. Machine gently pump air through a breathing tube into the *patient's* lungs in Corona virus infected patient?

A. Nasal cannulas ☐

B. Ventilators ☐

C. Sleep apnea devices ☐

D. None of the above ☐

20. The national helpline number for Covid -19 patient?

A. 1800-113-545 ☐

B. 1800-116-545 ☐

C. 1800-182-545 ☐

D. 1800-112-545 ☐

10. References

1. Dan Zhou *et al*. COVID-19: a recommendation to examine the effect of hydroxychloroquine in preventing infection and progression. Journal of Antimicrobial Chemotherapy *China doi:10.1093/jac/dkaa114* 2020; 1-4 .

2. Susan R. Weiss *et al*. Corona virus Pathogenesis and the Emerging Pathogen Severe Acute Respiratory Syndrome Corona virus. American Society for Microbiology Philadelphia, 2005, 69.4. 635-664.

3. Assessment of Evidence for COVID-19-Related Treatments: Updated 3/27/2020 Public access to AHFS Drug Information®

4. Usman A Ashfaq *et al*. Lysosomotropic agents as HCV entry inhibitors, *Virology Journal* volume 8, Article number: 163 (2011)

5. Gilling DH *et al*. Antiviral efficacy and mechanisms of action of oregano essential oil and its primary component carvacrol against murine norovirus, J Appl Microbiol. 2014 May; 116 (5): 1149-63

6. Chiang LC *et al*. Antiviral activities of extracts and selected pure constituents of Ocimum basilicum, Clin Exp Pharmacol Physiol. 2005 Oct;32 (10): 811-6.

7. Mondal S *et al*. Double-blinded randomized controlled trial for immunomodulatory effects of Tulsi (Ocimum sanctum Linn.) leaf extract on healthy volunteers, J Ethnopharmacol. 2011 Jul 14; 136(3): 452-6.

8. Hui Su Lee *et al*. *Foeniculum vulgare* Mill. Protects against Lipopolysaccharide-induced Acute Lung Injury in Mice through ERK-dependent NF-κB Activation, Korean J Physiol Pharmacol. 2015 Mar; 19(2): 183–189.

9. Leyla Bayan *et al*. Garlic: a review of potential therapeutic effects, Avicenna J Phytomed. 2014 Jan-Feb; 4(1): 1–14.

10. YuXian Li *et al*. In vitro antiviral, anti-inflammatory, and antioxidant activities of the ethanol extract of *Mentha piperita* L, Food Sci Biotechnol. 2017; 26(6): 1675–1683.

11. James Hudson *et al*. Echinacea—A Source of Potent Antivirals for Respiratory Virus Infections, Pharmaceuticals (Basel). 2011 Jul; 4(7): 1019–1031.

12. Hawkins J *et al*. Black elderberry (Sambucus nigra) supplementation effectively treats upper respiratory symptoms: A meta-analysis of randomized, controlled clinical trials, Complement Ther Med. 2019 Feb;42:361-365.

13. Karolina Młynarczyk *et al*. Bioactive properties of Sambucus nigra L. as a functional ingredient for foodand pharmaceutical industry, Journal of Functional Foods, Volume 40, January 2018, Pages 377-390

14. Liqiang Wang *et al*. The antiviral and antimicrobial activities of licorice, a widely-used Chinese herb, Acta Pharm Sin B. 2015 Jul; 5(4): 310–315.

15. Sanpha Kallon *et al*. *Astragalus* polysaccharide enhances immunity and inhibits H9N2 avian

influenza virus *in vitro* and *in vivo*, J Anim Sci Biotechnol. 2013; 4(1): 22.

16. Rajesh Arora *et al.* Potential of Complementary and Alternative Medicine in Preventive Management of Novel H1N1 Flu (Swine Flu) Pandemic: Thwarting Potential Disasters in the Bud, Evid Based Complement Alternat Med. 2011; 2011: 586506.

17. Kyungtaek Im *et al*. Ginseng, the natural effectual antiviral: Protective effects of Korean Red Ginseng against viral infection, J Ginseng Res. 2016 Oct; 40(4): 309–314.

18. Jia YY *et al*. Taraxacum mongolicum extract exhibits a protective effect on hepatocytes and an antiviral effect against hepatitis B virus in animal and human cells, Mol Med Rep. 2014 Apr;9(4):1381-7.

19. He W *et al*. Anti-influenza virus effect of aqueous extracts from dandelion, Virol J. 2011 Dec 14;8:538.

20. Gaber El-Saber Batiha *et al*. Syzygium aromaticum L. (Myrtaceae): Traditional Uses, Bioactive Chemical Constituents, Pharmacological and Toxicological Activities, *Biomolecules* 2020, *10*(2), 202;

21. CE Mair *et al*.Antiviral and anti-proliferative in vitro activities of piperamides from black pepper, Planta Med 2016; 82(S 01): S1-S381

22. https://www.livemint.com/news/world/beijing-promotes-traditional-medicine-as-chinese-solution-to-coronavirus-11584371007986.html

23. https://www.mayoclinic.org/diseases-conditions /coronavirus/ symptoms-causes/syc-20479963

24. Muhammad Adnan Shereen *et. al.* COVID-19 infection: Origin, transmission, and characteristics of human corona viruses, Journal of Advanced Research, Volume 24, July 2020, Pages 91-98.

25. Dan Zhou *et al.* COVID-19: a recommendation to examine the effect of hydroxychloroquine in preventing infection and progression. Journal of Antimicrobial Chemotherapy *China doi:10.1093/jac/dkaa114* 2020; 1-4 .

26. Leon Caly *et al*. The FDA-approved Drug Ivermectin inhibits the replication of SARS-CoV-2 *in vitro,* Antiviral Research *3 April 2020, 104787*

27. Sudhanidhi Jatil Rog Chikitsank, Vaidh Devisharan Garag, Dhanvantri Karyalya Aligarh (1976) page no. 64-106

28. https://www.who.int/gpsc/5may/Guide_to_Local_Production.pdf

Knowledge partner

Dr Ishwar Chandra Giri
(PRESIDENT APTI UP)

Mr. Mukesh Kumar
CEO & Director – Clinical Operations
RAHE LIFE SCIENCE

Mr. Dharmendra Singh
Associate Professor
IIMT College of Pharmacy Greater Noida(UP)

CEO Maxline Healthcare Lucknow

Mr. Rohit Choudhary
Principal
IIMT Pharmacy College Saharnpur (UP)

Director
Uttaranchal institute of pharmaceutical sciences,
Uttaranchal University Dehradun

Dr. Mamta
Principal
Deen Dayal Rustagi College of Pharmacy
Gurgaon (HR)

Mr. Brijesh Verma
HCG Hospitals
HealthCare Global Enterprises Ltd.
Bangalore

Knowledge partner

Dr. Pawan Jalwal
Dean & Head,
Baba Mastnath University, Rohtak

Dr. Renu Kadian
Principal
Ram Gopal Pharmacy College Gurgaon (HR)

Dr. Ajay Pal Singh
Professor
R. K. S. D. College of Pharmacy Kaithal (HR)

Dr. Akhil sharma
Director
R. J. College of Pharmacy Raipur Aligarh

Dr. Rekha Valecha
Lecturer
Meerabai Institute of Technology, Delhi

Mr.S.K.Singh
Associate professor & H.O.D
Samarth institute for education and technology Meerut

Mr. Nitin Jain
Asstt. Professor
LBS College of Pharmacy Jaipur

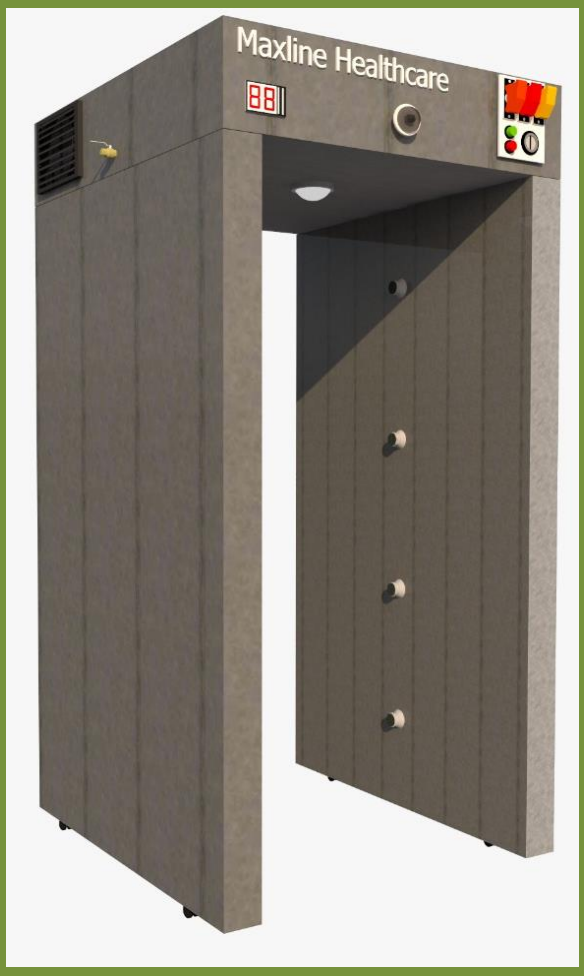
Dr. Manoj Kumar medal
Assistant Professor
Department of pharmaceutical sciences
Gjust, Hisa

COPARTNER

International Journal of Pharma Professional's Research

The Pharma Research

An International Peer Reviewed, Indexed Journal



SCOGAL
WE ARE LEARNER

HEAD OFFICE

Pharma Herald Bulletin

703/B-5, Panchsheel Greens-2, Greater Noida West, Gautam Buddh Nagar, UP-201309

https://www.aypponline.in,
https://lms.innovesen.co.in

Email: arvindrkgit@gmail.com

Phone No.: +91-9719638415, 8766381032