

COVID-19: ITS COMPLICATED REVIEW

Dr. Kousar Begum^{*1}, Simran Diwan², Kunchakuri Sai Ravalika³, Sepuri Vijayalaxmi⁴

¹Department of Pharmacy Practice, Malla Reddy College of Pharmacy, Dhulapally, Secunderabad, Telangana.

^{2,3}Department of Pharmacy, RGR Siddhanthi College of Pharmacy, Secunderabad, Telangana.

⁴Department of Pharmacy, O.U.

Received on: 20/10/2021

Revised on: 10/11/2021

Accepted on: 30/11/2021

*Corresponding Author

Dr. Kousar Begum

Department of Pharmacy
Practice, Malla Reddy
College of Pharmacy,
Dhulapally, Secunderabad,
Telangana.

ABSTRACT

Covid-19 is a contagious outbreak of pneumonia disease originated in wuhan. The diseases have since spread worldwide, leading to an ongoing pandemic. It caused by sars-cov-2 according to the coronavirus study group of the international committee on taxonomy of viruses belongs to the *coronaviridae* family, *betacoronavirus* genus, subgenus *sarbecovirus*. symptoms of covid-19 are variable, yet frequently incorporate with fever, shortness of breath, cough, generalized weakness, cold, chills, headache, loss of smell, body pains, loss of taste, dryness of throat, sputum, chest pain, vomiting with loose stools & loss of appetite. Side effects start one to fourteen days after openness to the infection. Symptoms of covid-19 are variable, yet frequently incorporate fever, hack, exhaustion, breathing challenges, and loss of smell and taste. Side effects start one to fourteen days after openness to the infection. Therefore, this paper provides in-depth information on covid-19 as it discusses the causes, risk factors & complications, pathophysiology, symptoms, diagnosis & treatment with vaccines.

1. INTRODUCTION

A corona virus is a kind of common virus that causes an infection in nose, sinuses, or upper throat. Most coronaviruses aren't dangerous.

In early 2020, after a December 2019 outbreak in China, the World Health Organization identified SARS-CoV-2 as a new type of coronavirus. The outbreak quickly spread around the world.

COVID-19 is a disease caused by SARS-CoV-2 that can trigger respiratory tract infection. It can affect upper respiratory tract (sinuses, nose, and throat) or lower respiratory tract (windpipe and lungs).

It spreads the same way other coronaviruses do, mainly through person-to-person contact. Infections range from mild to deadly. SARS-CoV-2 is one of seven types of coronavirus, including the ones that cause severe diseases like Middle East respiratory syndrome (MERS) About 858 people have died and sudden acute respiratory syndrome (SARS) 774 people died from an outbreak.^[1]

The virus that causes COVID-19 is in a family of viruses called Coronaviridae. Antibiotics do not work against viruses. Some people who become ill with COVID-19 can also develop a bacterial infection as a complication. In this case, antibiotics may be recommended by a health care provider.^[4]



Figure 1: COVID-19.

2. History: Where did COVID-19 come from?

The first known infections from SARS-CoV-2 were discovered in Wuhan, China. The original source of viral transmission to humans remains unclear, as does whether the virus became pathogenic before or after the spillover event. Because many of the early infectees were workers at the Huanan Seafood Market, it has been suggested that the virus might have originated from the market. However, other research indicates that visitors may have introduced the virus to the market, which then facilitated rapid expansion of the infections.^[3]

Past Coronaviruses: Are coronaviruses new?

Corona viruses were first identified in the 1960s. Almost everyone gets a coronavirus infection at least once in their

life, most likely as a young child. In the United States, regular coronaviruses are more common in the fall and winter.

The symptoms of most coronaviruses are similar to any other upper respiratory infection, including a runny nose, coughing, sore throat, and sometimes a fever.^[1]

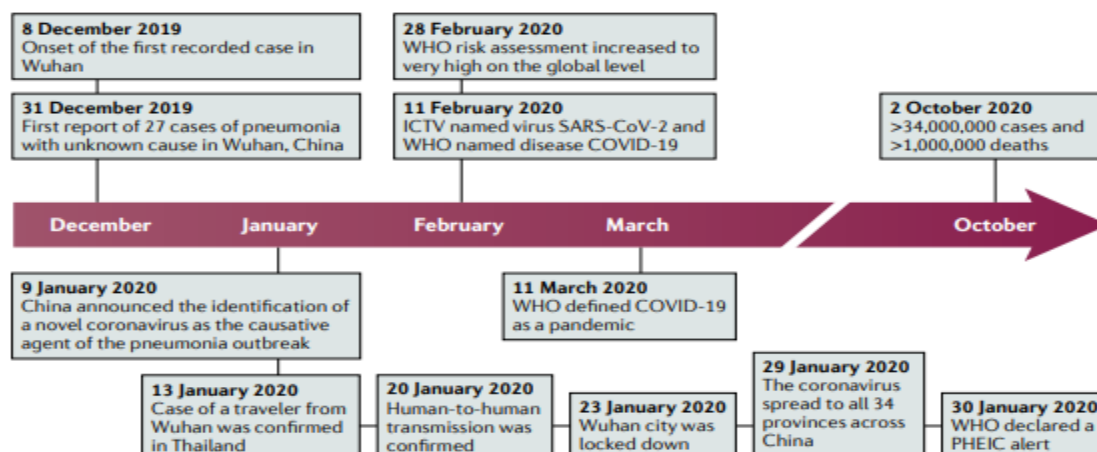


Fig. 1 | **Timeline of the key events of the COVID-19 outbreak.** The first recorded cases were reported in December 2019 in Wuhan, China. Over the course of the following 10 months, more than 30 million cases have been confirmed worldwide. COVID-19, coronavirus disease 2019; ICTV, International Committee on Taxonomy of Viruses; PHEIC, public health emergency of international concern; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2; WHO, World Health Organization.

Figure 2: timeline of the events of the COVID -19 OUTBREAK.^[11]

3. Causes Coronaviruses

Coronaviruses are zoonotic. This means they first develop in animals before being transmitted to humans. For the virus to be transmitted from animals to humans, a person has to come into close contact with an animal that has the infection.^[2]

COVID-19 is caused by infection with the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus strain.^[3]

Once the virus develops in people, coronaviruses can be transmitted from person to person through respiratory droplets. This is a technical name for the wet stuff that moves through the air when exhale, cough, sneeze, or talk.

The viral material hangs out in these droplets and can be breathed into the respiratory tract (windpipe and lungs), where the virus can then lead to an infection.

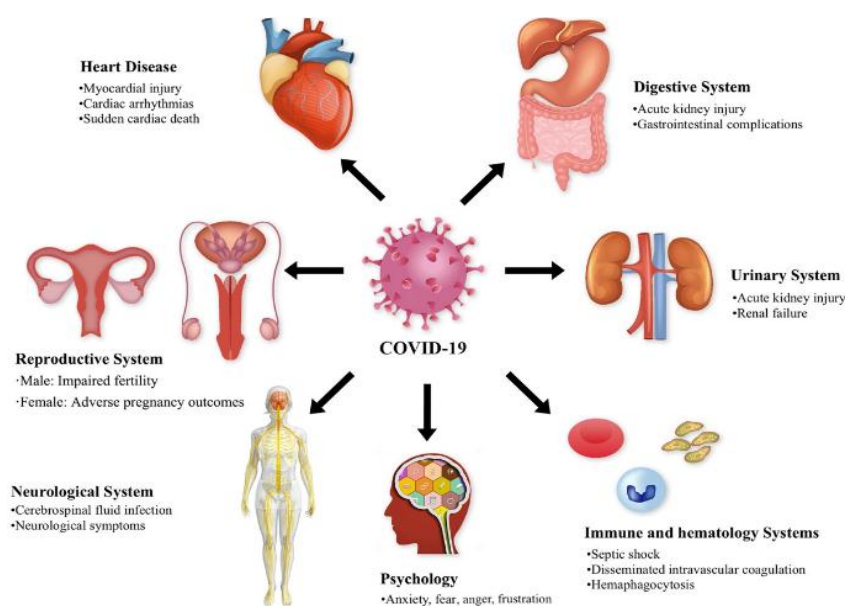


Figure 3: Causes of COVID-19.^[12]

4. Corona Virus Risk Factors & Complications

Anyone can get COVID-19, and most infections are mild. The older are the higher risk of severe illness.

- Acute respiratory distress syndrome (ARDS)
- irregular heart rate (arrhythmia)
- cardiogenic shock

- kidney injury or kidney failure (including needing dialysis)
- severe muscle pain
- fatigue heart damage or heart attack
- multisystem inflammatory syndrome in children (MIS-C); this is also known as pediatric multisystem inflammatory syndrome (PMIS)
- cancer
- serious heart conditions, such as heart failure, coronary artery disease (CAD), and cardiomyopathies
- chronic kidney disease
- chronic obstructive pulmonary disease (COPD)
- sickle cell anemia
- a weakened immune system from a solid organ transplant
- Pregnancy.^[2]
- Serious heart conditions such as heart failure or coronary artery disease
- Sickle cell disease
- Type 2 diabetes^[1]

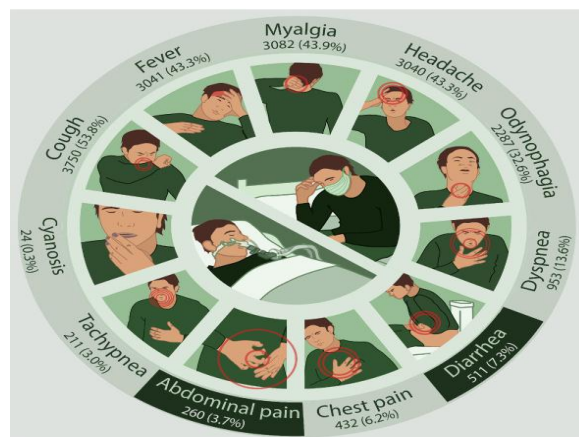


Figure 4: Risk factors & complications of COVID-19.^[13]

5. Pathophysiology

- Spike surface glycoprotein of the virus binds to the host via receptor binding domains of the angiotensin converting enzyme 2 (ACE2), which is most abundant in type II alveolar cells.
- 10 - 20 times higher binding affinity as compared with the SARS-CoV-1 virus.
- After a SARS-CoV-2 attaches to a target cell, the virion releases RNA into the cell, initiating replication of the virus which further disseminates to infect more cells.
- SARS-CoV-2 produces several virulence factors that promote shedding of new virions from host cells and inhibit immune response.
- Virus independent immunopathology in fatal COVID-19.
- Organ injury and death in COVID-19 is immune mediated rather than pathogen mediated.
- Tissue inflammation and organ dysfunction in fatal COVID-19 do not correlate with the tissue and cellular distribution of SARS-CoV-2

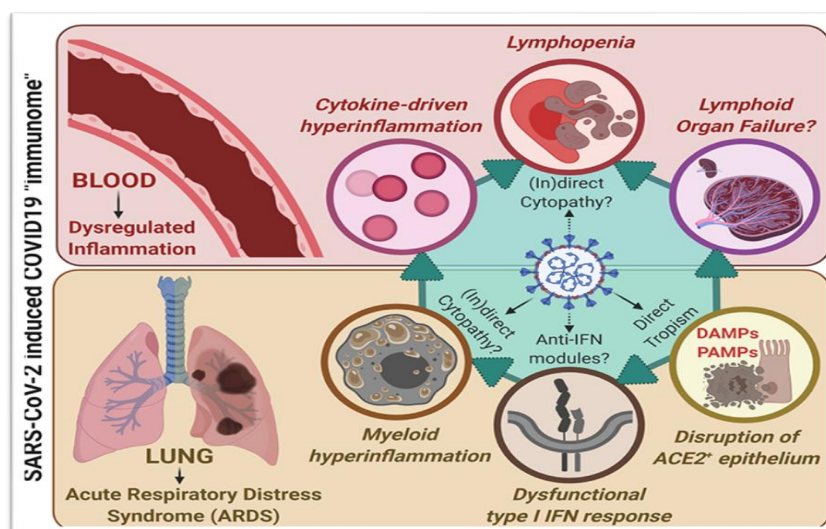


Figure 5: Pathophysiology of COVID-19.^[14]

6. Symptoms of Covid-19

Patient may carry the virus for 2 days or up to 2 weeks before patient may develop symptoms.

The main symptoms include:

- Fever
- Coughing
- Shortness of breath
- Trouble breathing
- Fatigue
- Chills, sometimes with shaking
- Body aches
- Headache
- Sore throat
- Congestion/runny nose
- Loss of smell or taste
- Nausea
- Diarrhea^[1]

IS IT THE FLU OR COVID-19?			
	SYMPTOM	FLU	COVID-19
	FEVER	✓	✓
	FATIGUE	✓	✓
	COUGH	✓	✓
	SORE THROAT	✓	✓
	HEADACHES	✓	✓
	RUNNY NOSE	✓	✓
	SHORTNESS OF BREATH	✓	✓
	BODY ACES	✓	✓
	DIARRHEA AND/OR VOMITING	✓	✓
	ONSET	1-4 days after infection	About 5 days after infection but can range from 2-14 days
	LOSS OF TASTE AND/OR SMELL		✓
	RED, SWOLLEN EYES*		✓
	SKIN RASHES*		✓
*EMERGING SYMPTOMS BASED ON RECENT DATA			

Figure 6: Symptoms Of Covid-19.^[15]

The most common symptoms among people who had COVID-19

- Fever 99%
- Fatigue 70%
- Cough 59%
- Lack of appetite 40%
- Body aches 35%
- Shortness of breath 31%
- Mucus/phlegm 27%^[1]

Mild COVID-19: have any of the typical symptoms of COVID-19 (such as cough, fatigue, or loss of taste or smell)

- Don't have shortness of breath or abnormal chest imaging
- At least one-third of all cases are asymptomatic.

- Almost 75 percent of people who are asymptomatic when they receive a positive polymerase chain reaction (PCR) test result will remain asymptomatic. PCR tests include nasal swab tests.

Severe COVID-19: Call emergency medical services if the following symptoms are present

- Trouble breathing
- Blue lips or a blue face
- Persistent pain or pressure in the chest
- Confusion
- Excessive drowsiness^[1]

The Centers for Disease Control and Prevention (CDC) is still investigating the full range of symptoms.^[2]

7. Coronavirus Transmission: How does the coronavirus spread?

SARS-CoV-2, the virus, mainly spreads from person to person. Most of the time, it spreads when a sick person coughs or sneezes. They can spray droplets as far as 6 feet away. If healthy person breathe them in or swallow them, the virus can get into body. Some people who have the virus don't have symptoms, but they can still spread the virus.

Patient can also get the virus from touching a surface or object the virus is on, then touching Patient mouth, nose, or possibly Patient eyes. Most viruses can live for several hours on a surface that they land on. A study shows that SARS-CoV-2 can last for several hours on various types of surfaces:

- Copper: 4 hours

- Cardboard: up to 24 hours
- Plastic or stainless steel: 2 to 3 days

That's why it's important to disinfect surfaces to get rid of the virus.

Some dogs and cats have tested positive for the virus. A few have shown signs of illness. There's no evidence that humans can catch this coronavirus from an animal, but it appears it can be passed from humans to animals.

How fast is it spreading: Means, The number of people infected by SARS-CoV-2 changes every day. See our news story for the latest updates on this developing story.

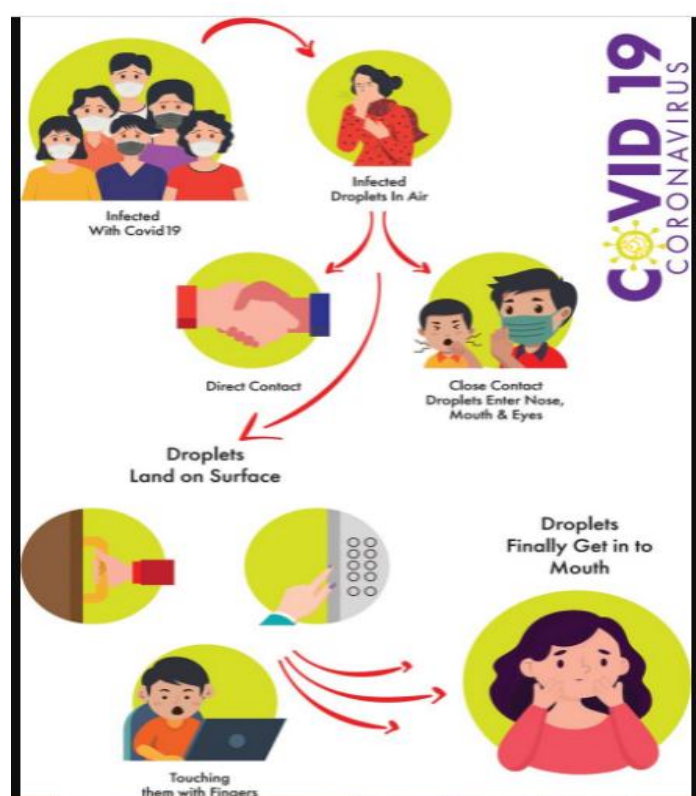


Figure 7: Coronavirus Transmission.^[16]

8. How contagious is the coronavirus?

The transmission rate is relatively high. Early research has estimated that one person who has it can spread it to between 2 and 3.5 others. One study found that the rate was higher, with one case spreading to between 4.7 and 6.6 other people. By comparison, one person who has the seasonal flu will pass it to between 1.1 and 2.3 others.

The CDC reports there is evidence it can be transmitted if you get within 6 feet of someone who is infectious for a total of 15 minutes throughout a day. It had previously been believed the exposure had to be 15 minutes at a time.^[6]

9. Coronavirus Diagnosis

- Fever of 100 F or higher

- Cough
- Trouble breathing

In most states, testing facilities have become more readily available. While some require an appointment, others are simply drive-up.

(PCR TEST FOR COVID) A swab test is the most common method. It looks for signs of the virus in patient's upper respiratory tract. The person giving the test puts a swab up of nose to get a sample from the back of nose and throat. That sample usually goes to a lab that looks for viral material, but some areas may have rapid tests that give results in as little as 15 minutes.

If there are signs of the virus, the test is positive. A negative test could mean there is no virus or there wasn't enough to measure. That can happen early in an infection. It usually takes 24 hours to get results, but the tests must be collected, stored, shipped to a lab, and processed.

A swab test can only tell whether person have the virus in their body at that moment. But may also consider taking an antibody test which can show whether person ever been exposed to the virus, even if the person didn't have symptoms.

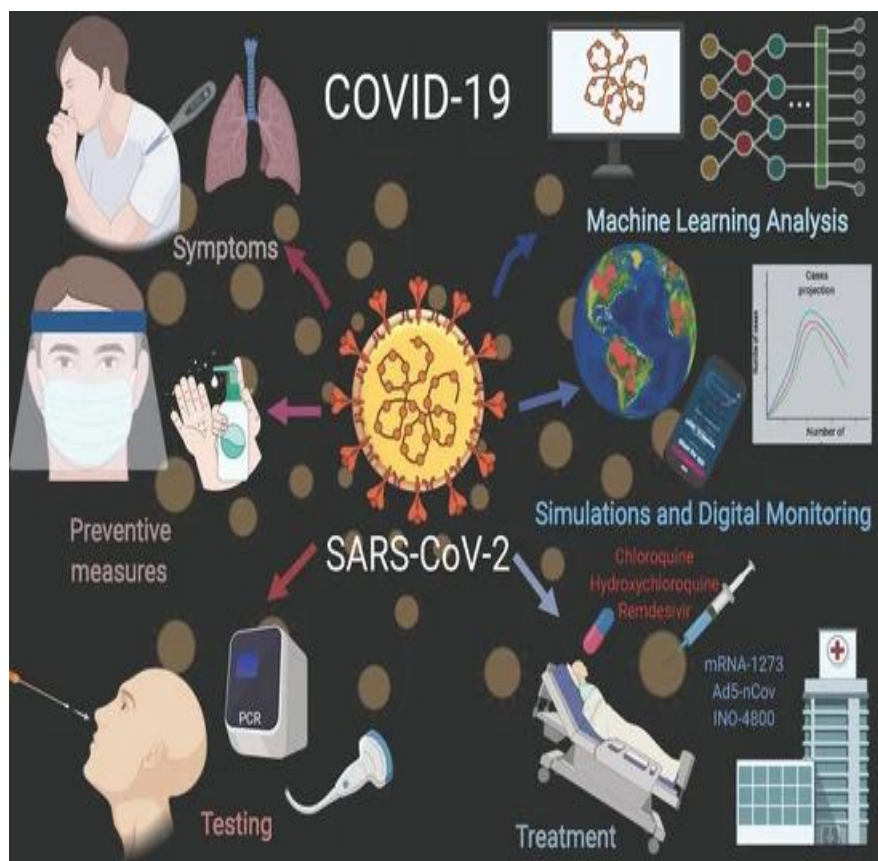


Figure no: 8 Coronavirus Diagnosis.^[17]

10. Coronavirus Transmission Take these steps

- **Wash your hands often with soap and water or clean them with an alcohol-based sanitizer** for at least 20 seconds which kills viruses on hands.
- **Practice social distancing.** Because Patient can have and spread the virus without knowing it, should stay home as much as possible. Stay at least 6 feet away from others.
- **Cover your nose and mouth in public.** If Patient have COVID-19, Patient can spread it even if you don't feel sick. Wear a cloth face covering to protect others. This isn't a replacement for social distancing. You still need to keep a 6-foot distance between yourself and those around Patient. Don't use a face mask meant for health care workers. And don't put a face covering on anyone who is:
 1. Under 2 years old
 2. Having trouble breathing
 3. Unconscious or can't remove the mask on their own for other reasons

- **Don't touch your face.** Coronaviruses can live on surfaces you touch for several hours. If they get on your hands and you touch your eyes, nose, or mouth, they can get into your body.
- **Clean and disinfect.** You can clean first with soap and water, but disinfect surfaces you touch often, like like phones, computers, tables, doorknobs, light switches, toilets, faucets, and sinks. Use a mix of household bleach and water (1/3 cup bleach per gallon of water, or 4 teaspoons bleach per quart of water) or a household cleaner that's approved to treat SARS-CoV-2. You can check the Environmental Protection Agency (EPA) website to see if yours made the list. Wear gloves when you clean and throw them away when you're done.^[7,8]

There's no proof that herbal therapies and teas can prevent infection.

Tips to Prevent Coronavirus Transmission



Figure 8: Coronavirus Transmission 18.

11. Coronavirus Treatment

There's no specific treatment for COVID-19. People who get a mild case need care to ease their symptoms, like rest, fluids, and fever control. Take over-the-counter medicine for a sore throat, body aches, and fever. But don't give aspirin to children or teens younger than 19.

People might have heard that, shouldn't take ibuprofen to treat COVID-19 symptoms. But the National Institutes of Health says people who have the virus can use nonsteroidal anti-inflammatory drugs (NSAIDs) or acetaminophen as usual.

Antibiotics won't help because they treat bacteria, not viruses. If you hear about people with COVID-19 getting antibiotics, it's for an infection that came along with the disease.

People with severe symptoms need to be cared for in the hospital. The antiviral medication called remdesivir (Veklury) is the first medication to get FDA approval for treatment of patients hospitalized with COVID-19. It's administered as an intravenous (IV) infusion as 200 mg in 100 ml NS. Originally developed to treat Ebola, evidence shows that those treated with remdesivir recovered

in about 11 days compared to 15 days for those treated with a placebo.

Many clinical trials are under way to explore treatments used for other conditions that could fight COVID-19 and to develop new ones. Monoclonal antibodies are human-made proteins that help the body develop an immune response against foreign-made substances such as viruses. For instance, trials are under way for tocilizumab, bamlanivimab, casirivimab and imdevimab, another medication used to treat autoimmune conditions. And the FDA is also allowing clinical trials and hospital use of blood plasma from people who've had COVID-19 and recovered to help others build immunity. Like remdesivir, they're also administered by IV infusion and intended to treat COVID-19 in people ages 12 years and older.^[2]

Early in the pandemic, the anti-malarial drugs hydroxychloroquine and chloroquine were considered as possible treatments. The FDA later rescinded an emergency use order because studies found that the drugs were ineffective and the risks outweighed the benefits.

A variety of steroid medications are being used including dexamethasone which is used to treat conditions such as arthritis, blood/hormone/immune system disorders, allergic reactions. Other than these like vitamins & minerals, to treat some of cell damage – vit C, to increase bone density – calcium and vit D3, to enhance the immune function and stabilize the blood sugar levels - Zinc tablets, anti coagulants, antiviral drugs & multi vitamins and in highly emergency conditions O2 supply were provided.^[1]

- Other than this there are different types of covid vaccines like Novavax. NVX-CoV2373. Phase 1.
- Serum Institute of India. COVOVAX (Novavax formulation) Phase 1.
- Zydus Cadila. ZyCoV-D. Phase 1.
- Gamaleya. Sputnik V. Phase 1.
- Oxford/AstraZeneca. AZD1222. Phase 1.
- Serum Institute of India. Covishield (Oxford/AstraZeneca formulation) Phase 1.
- Bharat Biotech. Covaxin. Phase 1.

In India we are preferring a. Covishield, Composition of Covishield includes inactivated adenovirus with segments of Coronavirus, Aluminium Hydroxide Gel, L-Histidine, L-Histidine Hydrochloride Monohydrate, Magnesium Chloride Hexahydrate, Polysorbate 80, Ethanol, Sucrose, Sodium Chloride, and Disodium Edetate Dihydrate (EDTA). b. Composition of Covaxin includes inactivated Coronavirus, Aluminum Hydroxide Gel, TLR 7/8 Agonist, 2-Phenoxyethanol and Phosphate Buffered Saline [NKA1].

CONCLUSION

Thus with this I conclude that, focusing on gender & age, males were more symptomatic like fever, dry cough & SOB than females who are in between the age group of 30-39 than 50-59 years. Different levels of management mainly

depend on clinical features and how they respond to the treatment. Major modalities of management include antibiotic, antiviral and steroid therapy having no direct relationship between the specific treatment and the outcome.

REFERENCES

1. <https://www.webmd.com/lung/coronavirus> on, 10-11-21.
2. <https://www.healthline.com/health/coronavirus-covid-19/outlook> on, 10-11-21.
3. https://en.wikipedia.org/wiki/severe_acute_respiratory_syndrome_coronavirus_2 on, 12-11-21.
4. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019> on, 10-11-21.
5. <https://www.pathologyoutlines.com/topic/lungnontumor/morocovid.html>, 15-11-21.
6. <https://www.who.int/transmission-of-sars-cov-2-implications-for-infection-prevention-precautions>, 23-11-21.
7. <https://www.unicef.org/covid-19/latest-information>, 20-11-21.
8. <https://www.cdc.gov/cleaning.htm> on, 22-11-21.
9. <https://covid19.trackvaccines.org/country/india>, 23-11-21.
10. <https://www.who.int/health-topics/coronavirus>, 21-11-21.
11. Ben hu et al., characteristics of sars-cov-2 and covid-19, nature reviews, microbiology, 2021; 19: 141.
12. Kenneth i. Zheng md et al., extrapulmonary complications of covid-19: a multisystem disease, wileyonlinelibrary.com/journal/jmv, j med virol, 2021; 93: 323-335.
13. Luis antonio díaz et al., symptom profiles and risk factors for hospitalization in patients with sars-cov-2 and covid-19: a large cohort from south america, gastroenterology vol. 159, no. 3, gastroenterology, 2020; 159: 1148-1150.
14. Els wauters et al., establishing a unified covid-19 “immunome”: integrating coronavirus pathogenesis and host immunopathology, www.frontiersin.org, 2020; 2(11): 1642. front. Immunol., 03 july 2020, <https://doi.org/10.3389/fimmu.2020.01642>.
15. <https://healthmatters.nyp.org/how-to-tell-the-difference-between-covid-19-vs-flu/>
16. Srikanth umakanthan et al., origin, transmission, diagnosis and management of coronavirus disease 2019 (covid-19), postgrad med j, 2020; 96: 753-758. Doi:10.1136/postgradmedj-2020-138234.
17. Mayar allam et al., covid-19 diagnostics, tools, and prevention, mdpi, diagnostics, 2020; 10(6): 409. <https://www.mdpi.com/2075-4418/10/6/409>, <https://doi.org/10.3390/diagnostics10060409>.
18. Medically reviewed by meredith goodwin, md, faafp, written by beth sissons, updated on november 29, 2020. <https://www.medicalnewstoday.com/articles/coronavirus-prevention>.