

Effect of Covid – 19 in India: An overall discussion

Voram.Shalini

Department of pharmacy practice
St.Peters institute of pharmaceutical sciences
Warangal, Telangana, India.

Manda.Sri Vinya

Department of pharmacy practice
St.Peters institute of pharmaceutical sciences
Warangal, Telangana, India.

Abstract:- Covid-19 is a dreadful pandemic. It is a disease caused by corona virus. Many countries have been affected and have been trying many ways to overcome it. In this paper we made an effort to provide information regarding corona virus and the Covid-19 disease caused by it. We mentioned the the effect of Covid in India. This paper also includes the statistical data and types of therapy being preferred to fight the virus. We discussed about the home remedies, preventive measures and also regarding poor knowledge of the people in the case of Covid – 19. The information of this paper was mainly taken from various sources like health or medical websites and mass media.

Keywords:- corona virus, covid -19, statistical data, lockdown, symptoms, mechanism, case studies, drug therapy, plasma therapy, clinical trials, home remedies, preventive measures.

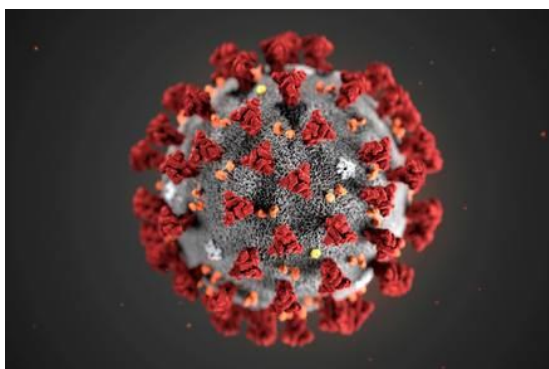


Fig 1:- Corona virus (source: Google images)

I. INTRODUCTION

COVID – 19: Corona Virus Disease 2019. This term was given by WHO. They identified SARS-Cov-2 as a new virus. It was first traced in China, December 2019 in Wuhan, Hubei. The first case was reported on 17th November 2019 in Hubei. [2]

- Corona virus is a virus that causes an infection in your upper respiratory tract (sinuses, nose, and throat) and lower respiratory tract (windpipe and lungs). [1]
- It belongs to Corona Viridae family, Nidovirales order. It has crown like spikes on the outer surface of the virus, thus it is named as ‘corona’ virus. The size of virus is 65 – 125 nm of diameter. It contains single stranded RNA as nucleic material. [3]

- There are different sub groups of corona virus like Alpha (α), Beta (β), Gamma (γ), Delta (δ). Beta group of this virus was found to cause Covid – 19. [3]
- SARS-Cov-2 is one of the different types of corona viruses, including those that cause severe diseases like MERS and SARS. [1]
- The other corona viruses cause most of colds that affect us during the year but aren't a serious threat for otherwise healthy people. [1] This virus is said to be zoonotic that means it spreads from animals to humans.
- It spreads in the same way like other corona viruses do, mainly through person to person contact.
- *Symptoms of Covid – 19: (National health portal, India)*
 - Most common: fever, dry cough, tiredness, Headache, sore throat.
 - Severe conditions: Difficulty in breathing/SOB, loss of taste and smell, Discoloration of fingers and toes.
 - Complications: Pneumonia, viral sepsis, acute respiratory distress syndrome, kidney failure, cytokine release syndrome.
 - According to researchers in China, these symptoms were the most among Covid – 19 patents: [1]
 - ✓ Fever – 99%
 - ✓ Fatigue – 70%
 - ✓ Cough – 59%
 - ✓ Lack of appetite – 40%
 - ✓ Body aches – 35%
 - ✓ Shortness of breath – 31%
 - ✓ Mucus/phlegm – 27%

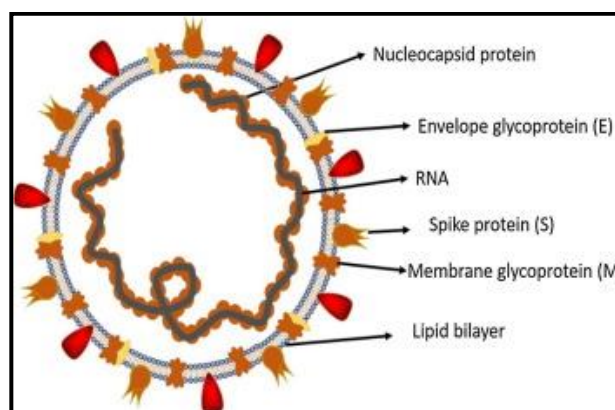


Fig 2:- Structure of corona virus causing respiratory illness (source: Google images)

➤ Mechanism:

- Covid – 19 has been shown to bind to ACE2 via the S protein on its surface.
- During infection, the S protein is cleaved into subunits, S₁ and S₂ contains the receptor binding domain (RBD) which allows corona viruses to directly bind to peptidase domain (PD) of ACE2. S₂ then likely plays a role in membrane fusion. [4]

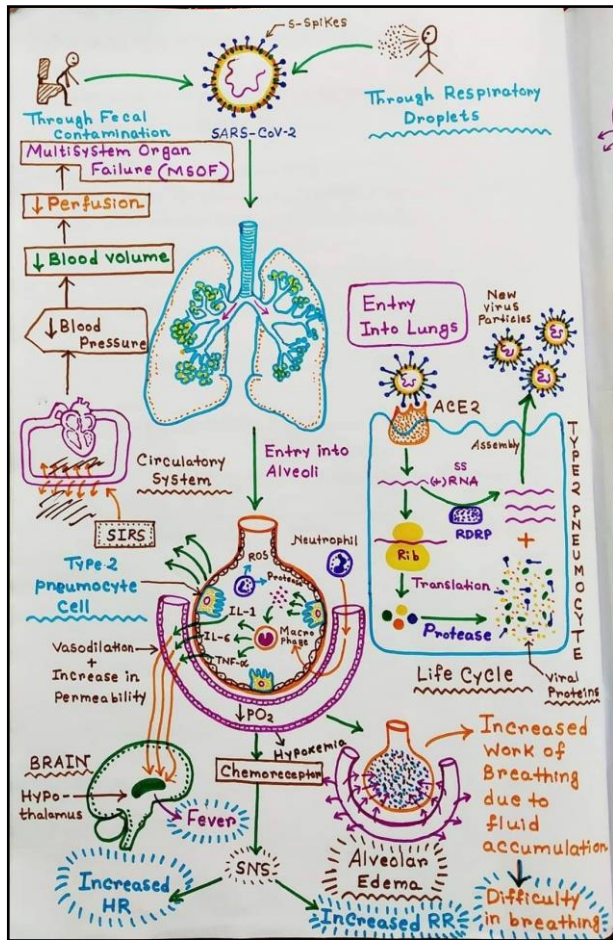


Fig 3:- Pictorial view of SARS-Cov-2 mechanism (source: Google images)

➤ Transmission: [5]

Virus gets transmitted from person to person by direct contact and also from animals to humans.

- Contact and droplet transmission: Through saliva, respiratory secretions caused by cold and cough. Once the virus reaches the areas of eyes, nose and mouth the person gets affected by the virus instantly.
- Fomite transmission: Droplets of cough or sneeze from infected person can contaminate the surfaces or objects. So, transmission can occur through contaminated surfaces easily when a healthy person comes into contact with them.

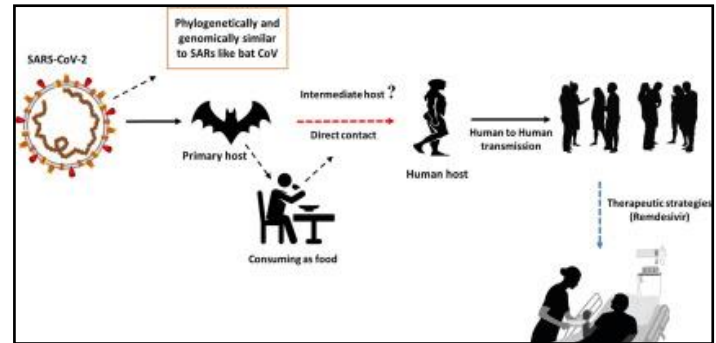


Fig 4:- Transmission of Covid – 19 (source: Google images)

➤ Diagnosis: (National health portal, India)

- It is diagnosed by molecular assays. Samples are collected from upper respiratory tract.
- Nasopharyngeal swabs, Oropharyngeal swabs are taken from URT.
- Sputum is collected from lower respiratory tract.
- Endotracheal aspirate or broncho-alveolar lavage in patients with severe respiratory illness.
- Molecular assays: RT-PCR, True NAT/CBNAAT. This indicates the presence of viral material.
- Serological tests: Collecting of blood samples, observing the immune responses, identifying the antibodies generated for virus.
- The patient may be symptomatic or asymptomatic. But on testing, if the presence of antibodies is observed, then the person is said to be affected by the virus.
- SARS-Cov-2 total assay detects both IgM and long lasting IgG antibodies.

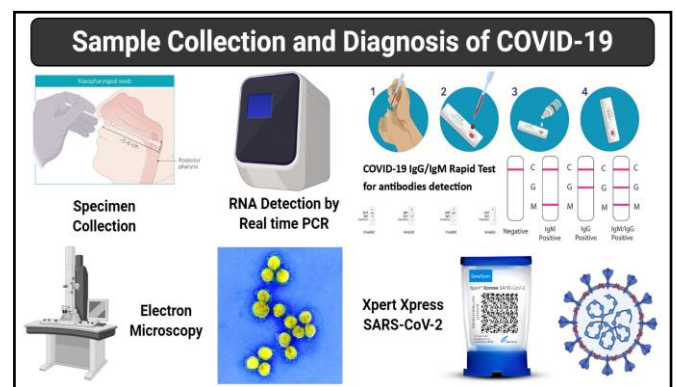


Fig 5:- Diagnostic tests – Covid-19 (Source: Google images)

II. STATISTICS

➤ Covid – 19 cases worldwide as of July 29,2020: [10]

- Outbreak of corona virus disease (Covid-19) had been confirmed in around 210 countries or territories around the globe.
- The virus had infected 17,008,358 people and the number of deaths had totaled around 665,730. The most severely affected countries include the US, Brazil and UK.

- *Covid – 19 cases in India: [10]*
- By July 29, 2020 the numbers of cases reported country wide have reached 1,582,581
- The number of deaths is 34,995
- The number of people recovered is 1,020,246.
- The recovery rate has been increasing day by day.

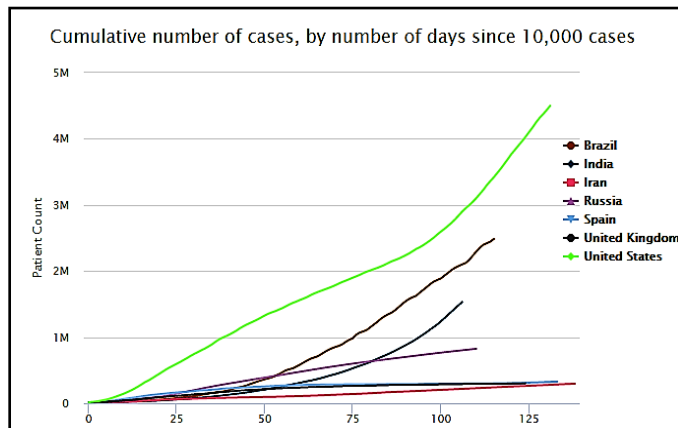


Fig 6:- Graph representing the rise of Covid – 19 cases
(source: [10])

- *Lockdown in India:*
- The main goal of lockdown was to control the spread of corona virus outbreak in India.
- On 24th March 2020, government of India ordered a national wide lockdown for 21 days initially. [5]
- The lockdown was placed when the number of confirmed cases in India was approximately 500.
- Lockdown majorly constituted Total 4 phases of lockdown and 2 phases of unlock. [5]
- The spread of virus was in control while in lockdown. But, increase in the number of positive cases and reported deaths were noted after the unlock.
- The lockdown was successful at first which later got ruined after the rotating population was initiated.
- As a result approximately thousands of new cases and hundreds of deaths are being reported each day.
- ❖ *Poor Knowledge Of People In Properly Monitoring The Disease:*
- Covid-19 has brought a fright in everybody and this has become a major problem. The only way to overcome the disease is to take proper treatment and precautions.
- Once a person was found positive with Covid-19, he/she is being left all alone and this is severely affecting their mental health and leading them to lose their self-confidence to fight the disease.
- The people who were found positive with Covid-19 or the people who have been in contact with Covid-19 patients have to quarantine themselves to stop the spread of virus.
- They might not have any symptoms, but still self-quarantine is very essential.
- In India, people who are tested positive, only they are being taken to quarantine and their family, friends or others who have been in contact with them are freely

moving out of the house while they should actually quarantine themselves.

- 'A 50 yr old man from Chittoor district in the state of Andhra Pradesh in India committed suicide on 12th February 2020. He locked his family and hanged himself to a tree. He has taken this major step after being informed by the doctor that he was suffering from a severe illness after a medical checkup.' The person mistook his condition to Covid-19 which he knew was dreadful disease according to few videos circling around social media. [13]
- From the fear of how society would treat them, many Covid-19 positive patients are hesitating to reveal their illness.
- Some illiterate people also tried escaping from hospital by the thought they may die in spite of taking treatment
- People should be given good knowledge regarding the disease, treatment, precautions, dos and don'ts to avoid the mistakes happening in the case of Covid-19.

III. CASE STUDIES

In this paper, case studies have been mentioned. One is the positive case of Covid-19 and other case was mistaken for Covid-19 and the patient got quarantined suspecting himself to be affected by the virus.

- **CASE-1:** A male patient of 52 yr who is type 2 diabetic got his CT scan for chest done. The result showed bilateral patchy ground glass opacities in the peripheral region. So he has given swab samples for Covid-19 test on 14th June 2020 and the result showed negative. On 21st June 2020 he had one episode of fever and two episodes of loose stools. He had on and off fever for a week. He was advised with Covid-19 test. He was tested positive for Covid-19 on 28th June after testing the sample. The patient was prescribed with Tab. Azithromycin 500 mg for 5 days. He was advised a treatment for 2 weeks i.e. with home isolation, pulse oximetry, Tab. Vitamin C TID, Tab. ACE ZINC 50 mg BD, Cap. Gen D3 60,000 U once a week. Then he took Tab. Dexa 4 mg OD for 3 days, Syrup Pinton Cs 10 ml TID for 5 days and Tab. Fabiflu 200 mg (9 tablets) BD. And simultaneously he was following some home remedies to overcome the illness. By July 2nd there were no signs of fever and cough. The patient got cured from Covid-19.
- **CASE-2:** A male patient of 54 yr who is a type 2 diabetic was admitted to hospital on 17th June 2020 with chief complaints of shortness of breath, dry cough and mild fever. He was shifted to MICU as his condition has not changed. His BP was 130/80 mmHg and PR was 90/min. He was administered with Inj. Lantus 18 units as to control his blood sugar level. He was prescribed with Tab. Dolo 650 mg BD, Syrup Ascoril and was being nebulized to relieve SOB. He was advised with Covid-19 test and the samples were collected. On 19th June there was no evidence of shortness of breath but the patient had mild cough. His BP was 120/80 mmHg and PR was 78/ min. His RFT was completely normal.

He was tested negative for Covid-19 and diagnosed with mild LRTI. On 20th June the patient was conscious and coherent. No evidence of SOB, dry cough, fever and normal stools were passed. BP was normal and PR was 88/min. The patient was prescribed with Tab. Vitamin C TID, Tab. Zinc OD. The patient was discharged and was absolutely normal.

- Covid-19 has created a panic in people round the globe. People are mistaking normal cold and cough as Covid-19. They are immediately getting admitted in the health care centers where the chance of acquiring the virus is very high. In hospitals there is lack of social distancing and poor hygiene in some places which is making the transmission of Covid-19 very easy.
- People should be made aware of such mistakes to avoid getting prone to virus or spreading it without following precautions.

Types of therapy being preferred to treat Covid – 19:

- Drug therapy
- Plasma therapy

DRUG therapy: The treatment regimen being followed according to the case's severity i.e. Mild, Moderate and Severe.

❖ Therapy for mild condition of Covid – 19:

• Anti-viral therapy:

1. Tab. **HYDROXYCHLOROQUINE** [HCQ] 400 mg BD for 1 day followed by 200 mg 1-0-1 [morning & night] (For patients in home isolation or Covid care center)

{Or}

Tab. **FAVIPIRAVIR** 1800 mg 1-0-1 [morning & night] followed by 800 mg for 6 days [total for 7 days] (for patients in DCHC)

If the above drug is contraindicated then prefer

Cap. **DOXYCYCLIN** 100 mg 1-0-1 [morning & night] for 5 days

+

Tab. **IVERMECTIN** 12 mg 1-0-0 for 3 days [only morning]

2. Cap. **OSELTAMIVIR** 75 mg 1-0-1 for 5 days

• Anti-coagulants:

Inj. **ENOXAPARIN** 40 mg S/C 1-0-0 [morning only] for 7 days

[If X-ray/ CT Thorax is showing ground glass opacities]

• Supportive therapy:

- a) Tab. Zinc 50 mg 0-1-0 [afternoon only] for 7 days
- b) Tab. Vit. C 500 mg 1-1-1 [morning, afternoon, night] for 7 days
- c) Tab. N Acetylcysteine 600 mg 1-1-1 for patients having cough.

Precautions:

- Contraindications for Tab. HCQ:
 - 1) QT Interval > 480 milliseconds
 - 2) Pre-existing cardiomyopathy and cardiac rhythm disorder
 - 3) History of unexplained syncope
 - 4) Retinopathy
 - 5) Hypersensitivity to HCQ
 - 6) Epilepsy condition
 - 7) Hypokalemia {K⁺ < 3Meq}
- Contraindications for Tab. FAVIPIRAVIR:
 - 1) Hyperuricaemia
 - 2) Severe hepatic & renal impairment
 - 3) Pregnant women & lactating females

❖ Therapy for moderate case of Covid – 19:

• Anti-viral therapy:

1. Inj. **REMDESIVIR** 200 mg IV on day-1 followed by 100 mg IV daily for 4 days [total 5 days]

If Inj. **REMDESIVIR** is not available then, Tab. HCQ 400 mg for 1 day followed by 200 mg 1-0-1 for 4 days.

NOTE: Co-administration of both **REMDESIVIR** & **HCQ** / **CHLOROQUINE** must be avoided.

2. Cap. **OSELTAMIVIR** 75 mg 1-0-1 for 5 days.

• Steroids:

Inj. **METHYL PREDNISOLONE** 0.5 – 1 mg / kg {Or}

Inj. **DEXAMETHASONE** 0.1 – 0.2 mg/kg for 3-5 days.

• Anti-coagulants:

Inj. **ENOXAPARIN** 40 mg S/C 1-0-0 for 7 days
IV antibiotics based on local ANTIBIOGRAM

• Convalescent plasma therapy:

4 – 13 ml/ kg [usually 200 ml single dose is administered slowly over not less than 2 hrs]

• Supportive therapy:

1. Tab. ZINC 50 mg 0-1-0 for 7 days
2. Tab. Vit. C 500 mg 1-1-1 for 7 days
3. Tab. N Acetylcysteine 1-1-1 in patients with cough

Precautions:

- Contraindications for REMDESIVIR:
 1. AST/ALT > 5 times upper limit of normal
 2. Severe renal impairment [i.e. eGFR < 30 ml/min] or need for hemodialysis
 3. Pregnant or lactating females
 4. Children [<12 yrs. of age]
- NO dose adjustment for REMDESIVIR if eGFR > 30ml/min

- **Formula to calculate eGFR in adults:**

- **eGFR male**

= [140 – age in years] × [wt in kg] / 72 × [serum creatinine in mg/dl]

- **eGFR female**

= [140 – age in years] × [wt in kg] × 0.85 / 72 × [serum creatinine in mg/dl]

- **Steroids:**

1. To be started preferably within 48 hrs of admission (or) if oxygen requirement is increasing and also if the inflammatory markers are increased.
2. Patient should be reassessed for every 12 hrs. and continuous monitoring of saturation should be provided.
3. Start on OXYGEN – nasal prongs 2-5 L/min or Face mask 5L/min

- ❖ **Severe/ critical cases:**

- **Anti-viral therapy:**

1. If the patient is not administered with Inj. **REMSDESIVIR** as a part of therapy previously, then it can be started immediately.

Inj. **REMSDESIVIR** 200 mg IV on day 1 followed by 100 mg IV daily for 4 days [total 5 days]

2. Inj. **TOCILIZUMAB** 8 mg / kg [maximum 800 mg at one time given slowly in 100 ml NS over 1 hr. Dose can be repeated once after 12 to 24 if needed

{or}

Inj. **ITOLIZUMAB** 1st dose 1.6 mg/kg dose IV infuse subsequent dose: weekly 0.8 mg/kg dose infusion over 4 hrs if required

3. Cap. **OSELTAMIVIR** 75 mg 1-0-1 for 5 days

- **Steroids:**

Inj. **METHYL PREDNISOLONE** 1-2 mg/kg (or) Inj. **DEXAMETHOSONE** 0.2 – 0.4 mg/kg for 3 – 7 days.

- **Anti-coagulants:** Inj. **ENOXAPARIN** 1mg/ kg body weight S/C 1-0-1 for 7 days.

- **PRONE VENTILATION:**

Inj. **CEFTRIAZONE** 1gm IV 1-0-1 and can be considered and **SEPSIVAC** 0.3 ml intradermal once a day for 3 days in case of septic shock.

IV diuretics in case of heart failure.

- **Supportive therapy:**

Tab. **ZINC** 50 mg 0-1-0 for 7days

Inj. **Vit. C** 1.5 gm IV 6 hrly for 5 days

Tab. **N Acetyl cysteine** 1-1-1

- **CONVALESCENT PLASMA THERAPY: [12]**

- **What is convalescent plasma therapy?**

Convalescent plasma therapy constitutes of separating plasma from the blood of an infected and recovered person. It contains anti-bodies. So, it is administered to the patient as a part of treatment for that particular disease. The plasma

administration helps the person's immune system to fight against the disease.

The therapy has not yet been approved. Yet this might help the patient to strengthen the immunity to overcome the virus.

Plasma is one of the important components of blood. It is pale yellow in color. The role of plasma is to carry nutrients, proteins, hormones to different parts of the body. The contents of plasma include water, salt, enzymes, antibodies, clotting factor proteins like albumin & fibrinogen.

- **To whom is this therapy very beneficial?**

1. People who don't respond to the drug therapy.
2. People with chronic medical conditions or severe illness like diabetes, heart diseases and also weak immune system.
3. This therapy is also useful to the people who are easily prone to the virus attack .i.e. health care department.

- **What is the risk of plasma administration?**

1. Allergic reactions
2. Heart / lung infections (rare cases)
3. Transmission of infections.

- **Who can donate plasma?**

All the people who recovered from Covid – 19 (aged from 18 to 60 and weighing not less than 50 kg)

They can donate the plasma after 14 days of their recovery.

Most of the doctors recommend maintaining a time of at least 3 weeks between recovery and plasma donation.

The people with comorbidities like diabetes, HTN, weakened lungs, cancer and also just delivered are prohibited from donating plasma.

500 ml of plasma is collected from donor. This therapy is approved as an off label therapy (investigational therapy)

- **Clinical trials for Covid – 19 vaccine has been initiated in India:**

Clinical trials for human vaccine have been initiated in the country. Approximately 1000 volunteers have been participating in the trials. [7]

As India is the largest producer of vaccine in the world, it is the main goal of the country to fast track vaccine development process to stop the spread of the virus. DCGI has permitted for two vaccines. One is developed by Bharat Biotech International limited in collaboration with Indian Council of medical research and the other vaccine by Zydus Cadila health care ltd. The DCGI has allowed for the first and second phase of human clinical trials. [7]

'Covaxin' is the first vaccine developed by India against Covid – 19 and is derived from a strain of SARS-Cov-2 isolated by ICMR-National institute of virology, Pune. [8]

Vaccine was administered to the people who were a part of the trial and all were absolutely fine confirmed the officials. [8] First part of phase I human trials of 'Covaxin' were conducted and obtained positive response. AIIMS, Delhi administered the first dose of 'Covaxin' to a 30 yr. old man. Besides 'Covaxin' another experimental shot being developed by Zydus Cadila has also started human clinical trials. [9]

❖ HOME REMEDIES TO PREVENT OR TREAT THE SYMPTOMS OF COVID-19:

- Gargling with warm water mixed with a pinch of salt 2-3 times a day can help treating sore throat. [15]
- 'Mulethi' can be added to tea. It possesses anti-viral property and anti-oxidants present can boost your immunity. [15]
- Apple cider vinegar can be mixed with warm water and taken as a drink everyday. It shows anti-inflammatory action. [15]
- Triphala tea helps boost your immune system.
- Steamer can be used to vapourize with water and a pinch of turmeric.
- High intake of citrus fruits or vegetables like oranges, Indian gooseberry, strawberries, pineapple, sweet lime, lemon and spinach is advised.
- Tab. Vitamin C can also be taken if citrus foods are not available.
- Drinking milk with a pinch of turmeric, black pepper powder is helpful to clear cough and cold.
- Herbal tea with cinnamon, cardamom, clove, tulasi leaf, jaggery acts as immunity booster.
- Practice of Pranayama (breathing exercises), Bhastika, Anuloma viloma pranayama, Savasan and Kapalbhathi is recommended.

❖ PRECAUTIONS TO AVOID COVID-19: [10]

- Clean your hands very often by using soap & water or alcohol based handrub.
- Maintain a safe distance from anyone who is coughing or sneezing around you.
- Wear a mask regularly and especially when social distancing is not possible.
- Do not touch your face, eyes, nose or mouth unnecessarily.
- Cover your nose and mouth using a tissue or your bent elbow while you cough or sneeze.
- Stay home when you feel sick.
- Seek medical help immediately if you have a fever, cold, cough and shortness of breath.
- Masks can protect you from the spread of virus from person to person, but using mask alone cannot help.
- Maintain a proper hygiene and follow advice provided by your health authority.

❖ ABBREVIATIONS:

- RT PCR - Reverse transcription polymerase chain reaction
- NAAT/CBNAAT – Nucleic acid amplification tests/ cartridge based nucleic acid amplification test
- SARS – Severe acute respiratory syndrome

- MERS – Middle east respiratory syndrome
- ACE2 – Angiotensin converting Enzyme 2
- URT – Upper respiratory tract
- TID – Ter in die (Thrice in a day)
- BD - Bis in die (Twice a day)
- eGFR – Glomerular filtration rate
- DCGI – Drug controller general of India

REFERENCES

- [1]. Corona virus & Covid-19: <https://www.webmd.com>
- [2]. Covid-19 2019: https://en.m.wikipedia.org/wiki/coronavirus_disease_2019
- [3]. COVID-19 infection: <https://www.sciencedirect.com/science/article/pii/S2090123220300540--size>
- [4]. Mechanism: <https://www.drugtargetreview.com/news/56895/scientists-demonstrate-how-covid-19-infects-human-cells/>
- [5]. Transmission: <https://www.who.int/news-room/commentaries/detail/transmission-of-sars-cov-2-implications-for-infection-prevention-precautions--transmission>
- [6]. Lockdown in India: https://en.m.wikipedia.org/wiki/Covid-19_pandemic_lockdown_in_India
- [7]. Human clinical trials for Covid-19 initiated in India - <https://health.economictimes.indiatimes.com>
- [8]. Human clinical trial of Covid vaccine 'Covaxin' begins: <https://www.ndtv.com/india-news/coronavirus-india-human-clinical-trial-of-covid-19-vaccine-covaxin-begins-at-odisha-hospital-2269717>
- [9]. Clinical trials: <https://indianexpress.com/article/coronavirus/coronavirus-covid-19-vaccine-covaxin-bharat-biotech-latest-updates-6524413/lite/>
- [10]. Preventive measures of Covid-19: <https://www.google.com/search?q=preventive+measures+of+covid+19>
- [11]. Corona virus statistics: <https://www.worldometers.info/coronavirus/worldwide-graphs/>
- [12]. What is plasma? <https://www.urmc.rochester.edu/encyclopedia/content.aspx?contentTypeID=160&ContentID=37->
- [13]. Convalescent plasma and covid-19: [https://jamanetwork.com/journals/jama/fullarticle/2767351-- Risk of plasma.](https://jamanetwork.com/journals/jama/fullarticle/2767351--Risk%20of%20plasma)
- [14]. Home remedies: <https://timesofindia.indiatimes.com/life-style/health-fitness/home-remedies/covid-19-try-these-simple-home-remedies-to-treat-a-sore-throat/photostory/76402743.cms>
- [15]. Fearing he had contracted corona virus, man locks family and kills himself, Hindustan times, 2020.