



Review Article

Coronavirus managing strategies – An update

Sumit Bhateja^{1,*}, Shaik Ali Hassan¹, Geetika Arora²¹Dept. of Oral Medicine and Radiology, Manav Rachna Dental College, Faridabad, Haryana, India²Dept of Public Health Dentistry, Inderprastha Dental College, Ghaziabad, Uttar Pradesh, India

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ABSTRACT

A name called coronavirus is everywhere which started in Wuhan in CHINA and now spread all over the world. It has become now pandemic. The first case came on 17th January 2020 in China. It has affected globally there are 1,426,096 in this total death are 81,865 recovered are 300,054. The United States of America is the most affected with 396,223 confirmed cases with 12,722 deaths. In India there are 5,274 confirmed cases and 152 total deaths, most of the confirmed cases are from Maharashtra with 1018 confirmed cases with 61 deaths followed by Tamilnadu with 690 confirmed cases and 6 deaths. Many alternative medicines are being used in India like the department of Ayush under the government of India prescribed various ayurvedic and umami drugs for prophylaxis and there is also the use of hydroxychloroquine. In this article, we will see various managing strategies for Novel Coronavirus.

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1. Introduction

In the present world, the only word we hear is COVID-19 also called novel coronavirus, which has spread all over the globe, originated from Wuhan in China.¹ It started on November 17th, 2019 it was reported and now it becomes a major challenge in the global world which has become very hard to treat as there is no antidote for the virus till date. Coronaviruses affects numerous types of creatures, including people. Coronaviruses have been portrayed for over 50 years, the disengagement of the model Murine coronavirus strain, for instance was accounted in 1949. WHO held its first meeting on 23 January 2020 which stated that International Health Regulation for the outbreak of novel coronavirus (2019-nCoV).² WHO on 23rd January 2020 held a meeting about novel coronavirus which discussed the spread and efforts made by china in investigating and contain the virus which started in China. Globally there are 1,426,096 in this total death are 81,865 recovered are 300,054.³ The United States of America

is the most affected with 396,223 confirmed cases with 12,722 deaths.⁴ In India there are 5,274 confirmed cases and 152 total deaths,⁵ most of the confirmed cases are from Maharashtra with 1018 confirmed cases with 61 deaths followed by Tamil Nadu with 690 confirmed cases and 6 deaths.⁶ Dentists are in direct contact with the oral cavity they are more prone to get infected as the virus spreads through droplets. Dentists in affected countries have stopped the treatment, and they are offering only emergency treatments like extraction, severe periodontal pain. In this article, we will emphasize the various treatment options for the treatment of novel coronavirus.

2. Viral Etiology

It belongs to family coronaviridae with the ssRNA genome. Novel coronavirus similar to SARS-CoV and Middle East respiratory syndrome coronavirus (MERS-CoV), SARS-CoV-2 is zoonotic, with Chinese horseshoe bats (*Rhinolophus sinicus*) being the most probable origin and pangolins as the most likely intermediate host.⁷ The novel coronavirus is an RNA virus which has inner and

* Corresponding author.

E-mail address: sumit.mrdc@mrei.ac.in (S. Bhateja).

outer structure. The inner structure includes the RNA and nucleocapsid. The outer structure includes the spike glycoprotein, haemagglutinin esterase, transmembrane protein, and membrane-spanning protein. Most important in these are the spike protein which is the characteristic for the coronavirus.⁸ It is a positive RNA which is the largest RNA virus till date.^{9,10}

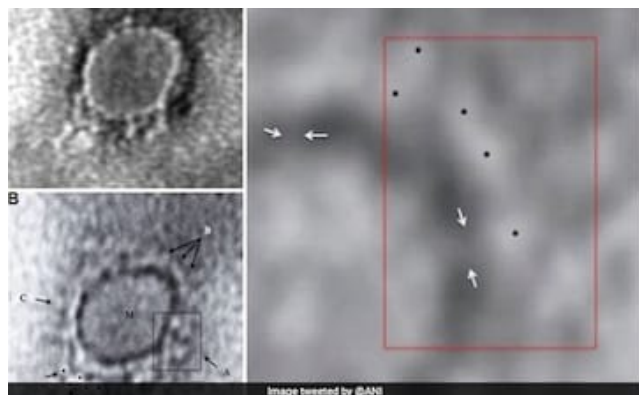
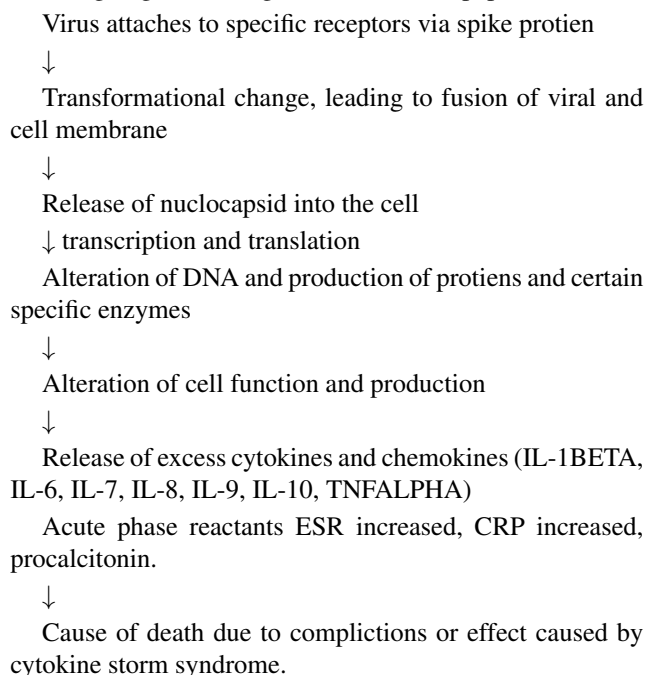


Fig. 1: Figure 1- electron microscope view of coronavirus isolated from 1st patient in India.

3. Pathogenesis

Novel coronavirus has an incubation period of 5 to 7 days, but most of the symptoms appear on 14th day.¹¹ It has a unique pathogenesis by using spike protein. It causes both upper respiratory tract infection and lower respiratory tract infection. The spread is through droplets during sneezing and coughing and through surface (tables, paper, desks).¹²



4. Pathophysiology

Coronavirus is having an envelop, positive-stranded RNA infections has nucleocapsid pathogenetic virus like SARS-CoV-2. In CoVs, the genomic structure is sorted out in a +ssRNA of roughly 30 kb long the biggest known RNA virus and with a 5'-top structure and 3'-poly-A tail. Beginning from the viral RNA, the blend of polyprotein 1a/1ab (pp1a/pp1ab) in the host has figured it out. The translation works through the replication-interpretation complex (RCT) sorted out in twofold layer vesicles and utilizing the union of subgenomic RNAs (sgRNAs) groupings.

In the atypical Coronavirus genome, in any event, six ORFs can be available. Among these, a frameshift somewhere in the range of ORF1a and ORF1b guides the creation of both pp1a and pp1ab polypeptides that are prepared by virally encoded chymotrypsin-like protease (3CLpro) or primary protease, just as a couple of papain-like proteases for delivering 16 non-auxiliary proteins. Aside from ORF1a and ORF1b, different ORFs encode for auxiliary proteins, including spike, film, envelope, and nucleocapsid proteins (11) and extra proteic chains. Diverse CoVs present uncommon auxiliary and adornment proteins interpreted by committed sgRNAs.

5. Population at Risk

The people who are at risk are immunosuppressed patients who have multiple diseases. Those people who have chronic disorders like diabetes mellitus, hypertension, bronchial asthma and old age people.¹³

5.1. Screening for novel coronavirus (COVID-19)

There are 52 screening centers in India.¹⁴ The kits for testing the COVID-19 are given below.¹⁵

Table 1:

Name of the company	Name of the kit
1. Altona Diagnostics	Real Star SARS-CoV-2 RT-PCR kit 1.0
2. MY LAB	Patho detect
3. KILPEST (BLACKBIO)	TRUPCR
4. Seegene	Allplex 2019-nCoV assay
5. SD Biosensor	nCoV Real-Time Detection kit

The screening depends on the following data:¹⁶

1. White blood cell count can change most common is the leucopenia (less than 4000/mm³)
2. Reduced lymphocyte count is the most common finding
3. Increased ferritin level is the early finding
4. Increased AST and ALT

5. Increased ESR (erythrocyte sedimentation rate)
6. Increased procalcitonin
7. Increased D-Dimer
8. Virus is conformed by rt-PCR
9. Chest imaging ground glass calcification with or without consolidation

Bilateral peripheral involvement especially lower lobe.

5.2. Current protocol for screening in India

There are mainly 2 strategies that are those who are asymptomatic patients who have international travel history and all contacts of confirmed cases.

5.3. Asymptomatic cases who have a travel history

6. Person should stay at home for 14 days

1. They should be tested if they have symptoms like cold, fever, difficulty in breathing.
2. If found positive they should be sent to isolation wards and treatment to be given.

6.1. All laboratory conformed cases

1. They should be home quarantined for 14 days.
2. They should be tested if they have symptoms like cold, fever, difficulty in breathing.
3. If found positive they should be sent to isolation wards and treatment to be given.¹⁷

6.2. Management

Nothing has been confirmed by the WHO about treatment protocols. So most of the cases are dealt with supportive care.

Supportive care includes the following-

1. Maintain airway, breathing, and circulation.
2. Ventilation if required for serious cases.
3. Isolation to prevent the spread of disease.
4. Correct the electrolyte imbalance.
5. Correct or control the temperature.

The various treatment has been devised for treating and preventing but these are not approved by WHO these are alternative medicines.

They are of 2 types which are the AYUSH medications and modern medications.

6.3. Differential diagnosis

The differential diagnosis includes all types of respiratory viral infections like influenza, parainfluenza, respiratory syncytial virus (RSV), adenovirus, human metapneumovirus. Atypical microorganisms and bacterial disease. So, there is no proper symptom for the disease, so we have to consider the travel history.

6.4. Ayush medications

6.4.1. Ayurvedic medicines

As per ayurvedic ways various ways for prevention are advised-

1. Maintain good body hygiene.
2. Wash the hands with soap and water for at least 20 seconds.
3. Drink Shadang Paniya (Musta, Parpat, Usheer, Chandan, Udeechya & Nagar) processed water (10 gm powder boiled in 1-liter water, until it reduces to half). Store it in a bottle and drink it when thirsty.
4. Avoid touching your eyes, nose, and mouth with unwashed hands.
5. Avoid close contact with people who are sick.
6. Stay home when you are sick.
7. Cover your face during a cough or sneeze and wash your hands after coughing or sneezing.
8. Clean and disinfect frequently touched objects and surfaces.

6.4.1.1. Immunomodulatory drugs as given in Ayurveda are-

1. Agastya Harityaki 5 gm, twice a day with warm water.
2. Samshamani Vati 500 mg twice a day.
3. Trikatu(Pippali, Marich & Shunthi) powder 5 gm and Tulasi 3-5 leaves (boiled in 1-liter water, until it reduces to $\frac{1}{2}$ liter and keeps it in a bottle) keep taking it in sips as and when required.
4. Ratimarsa Nasya: Instill two drops of Anu taila/Sesame oil in each nostril daily in the morning.¹⁸

6.4.2. Department of Ayush, Unani medicines

1. SharbatUnnab 10-20ml twice a day.
2. TiryqaArba 3-5g twice a day.
3. TiryqaNazla 5g twice a day.
4. KhamiraMarwareed 3-5g once a day.
5. Massage on scalp and chest with Roghan Baboona/Roghan Mom/Kafoori Balm.
6. Apply Roghan Banafsha gently in the nostrils.
7. Take ArqAjeeb 4-8 drops in freshwater and use four times a day
8. In case of fever, take Habb e Ikseer Bukhar 2 pills with lukewarm water twice daily.
9. SharbatNazla 10ml mixed in 100ml of lukewarm water twice daily
10. Qurs e Suaal 2 tablets to be chewed twice daily.
11. Arq extracted along with SharbatKhaksi is very useful, arq extracted drugs are-

In case of sore throat following unani medicines can be used-

Table 2:

Unani drug	Common name
1. Chiraita	Indian Gentian
2. Kasni	Common chicory
3. Afsanteen	Common sagewort
4. Nankhawa	Ajowan
5. Gaozaban	Borage
6. Neem Bark	Margosa
7. SaadKoofi	Cypriol

Table 3:

Name of unani drug	Common name	Dosage
1. Khashkhash	Papaversomniferum	12g
2. Bazrulbanj	Hyoscyamusniger	12g
3. Post Khashkhash	Papaversomniferum	12g
4. Barg e Moard (Habbulaas)	Myrtuscommunis	12g
5. Tukhm e kahu Mukashar	Lactuca Sativa	12g
6. GuleSurkh	Rosa damascene	12g

6.4.3. Homeopathic medicines

Homeopathic drugs are most commonly used as preventive drugs. They are mostly used to reduce the symptoms of flu, indigestion. It has been known that homeopathy can treat cholera, Spanish influenza, scarlet fever, Diphtheria, typhoid.¹⁹ A Health advisory by the Ministry of AYUSH against coronavirus infection was given in January 2020 had a Homoeopathic medicine Arsenicum album – 30 as a possible preventive for flu-like symptoms such as coronavirus infection.²⁰ Scientific Advisory Board said that the same medicine has been prepared for the prevention of Influenza-Like symptoms.^{21–23} Arsenic alum causes a decrease in NF-kB (reduced expression of reporter gene GFP in transfecting HT29 cells), reduces TNF-ALPHA in macrophages.²⁴ Moreover, arsenic alum is used in respiratory illness which is very common in daily practice in Homeopathy.²⁵

7. Modern Medicine

7.1. Advisory on the use of hydroxychloroquine as prophylaxis

On March 20th, 2020 an advisory was issued by the government of India on the use of hydroxychloroquine as prophylaxis for SARS-COV-2 infection, the national task force for COVID-19 constituted by Indian Council for Medical Research (ICMR) has recommended hydroxychloroquine as a preventive medication for a high-risk population.

The higher risk population includes the following-

1. Health care workers who are in the care of suspected cases.
2. Asymptomatic households of confirmed cases.

The protocol recommended by the national task force is approved by the drug controller general of India on emergency cases. Hydroxychloroquine is found to be effective against coronavirus in laboratory studies in vivo and in vitro studies.

7.1.1. Dose of hydroxychloroquine

1. Asymptomatic health care workers who are involved with suspected or conformed cases of COVID-19 has to have 400mg on day 1 followed by 400mg weekly once for next 7 weeks after meals.
2. Asymptomatic household contacts of laboratory conformed cases have to have 400mg twice a day on day 1 followed by 400mg once weekly for next 3 weeks to be taken with meals.

7.1.2. Contraindications of drug

1. Drug should not be given to children below age of 15.
2. Drug is contraindicated in retinopathy patients, known hypersensitivity patients towards hydroxychloroquine.
3. Drug has to be given only after registered medical practitioner. Adverse effects have to be checked by pharmacovigilance department.²⁶

7.2. Broad spectrum oral antiviral EIDD-2801

To start about this drug this is under the clinical testing phase. This is being used in humans and mice and they have shown promising results. Research says that EIDD-2801, an oral antiviral drug, can be used as either a prophylactic or therapeutic for SARS-CoV-2. The drug also showed good results against related coronaviruses SARS-CoV and MERS-CoV.²⁷

7.2.1. Mechanism of Action

EIDD-2801 is the same as remdesivir, both drugs work by mimicking ribonucleosides, the primary components of RNA molecules causing debilitating errors when the drugs are incorporated into viral RNA during replication, preventing the spread of the virus. However, scientists think the EIDD-2801 has many good impacts that have to be verified after many trials.²⁸

When given as a treatment 12 or 24 hours after the infection has begun, EIDD-2801 can reduce the degree of lung damage and weight loss in mice, which is expected to be longer in humans. Human trials to begin shortly in the next few weeks. If successful this would prove as a first-line defense against coronavirus.²⁹

7.3. Plasma exchange method

There is a common treatment for multiple inciting events and has been used for treatment for years, therapeutic plasma exchange has a benefit on multiple levels by removing inflammatory cytokines, stabilizing endothelial membranes, and resetting the hypercoagulable state.^{30–32}

Plasma from coronavirus cured patient or recovered patient is very useful as it includes various antibodies that can treat various patients to patients on a ventilator. A trial was done for the use To determine whether convalescent plasma transfusion may be beneficial in the treatment of critically ill patients having severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. It was done in 5 patients who were on ventilators as they were in critical condition. The results were very beneficial as the results came as out of 5 patients aged 36–55 age mark who were on a ventilator all received antiviral agents and methylprednisolone. Following plasma transfusion, body temperature normalized within 3 days in 4 of 5 patients, the SOFA score decreased, and Pao₂/Fio₂ increased within 12 days (range, 172–276 before and 284–366 after). Viral loads also decreased and came as negative within 12 days following transfusion, and SARS-CoV-2-specific ELISA and neutralizing antibody titers increased after transfusion (range, 40–60 before and 80–320 on day 7).³³ This says that the plasma exchange method can be used for treating coronavirus. In India, ICMR is starting clinical trials for plasma exchange with 2 objectives to assess the efficacy of TPE in improving the clinical status of COVID-19 patients and to evaluate the safety of treatment with anti-SARS-CoV-2 plasma in patients with COVID-19.³⁴

7.4. Favipirvir

The medication as of late got endorsement (Feb 15/2020) in China for treating novel Influenza infection. The medication is demonstrating adequacy against SARS-COV-2 in some continuous preliminaries. It is an RNA polymerase inhibitor. The medication additionally has the strength to obstruct the replication of Flavin, alpha, file, field, Noro and other RNA infection.^{35,36}

7.5. Ritonavir

It is additionally an expansive range of antiviral like Lopinavir. Ribavirin in blend with Lopinavir/Ritonavir was appeared to bring down the danger of intense respiratory pain disorder (ARDS) advancement in patients. The blend additionally has appeared to bring down the danger of death in the infection of tainted patients in a study.^{35,36}

7.6. Prevention

Isolate all the confirmed or suspected cases with mild illness at home. ventilation of the home should be good with

sunlight to allow for the destruction of the virus. Patients should be asked to wear a simple surgical mask and practice hygiene.

1. Doctors, nurses, attendants have to wear a surgical mask when they are in the same room and use hand sanitizer every 15–20 min.
2. Patients should be placed in separate rooms or in the same ward. The rooms and surfaces and equipment to decontaminate with sodium hypochlorite.³⁷
3. All the persons should maintain a 3 feet distance between two persons
4. Frequent touching of hands to face, nose, eyes should be reduced and stopped as the virus can enter through the mouth and respiratory pathway.
5. Healthcare workers which include doctors, nurses, attender has to be provided with the PPE kit and N95 face mask.
6. The use of a homemade face mask is a must in the present scenario, as said by our honorable prime minister of India.³⁸
7. If you leave your home, always keep a distance of at least 2 arms lengths (approximately 2 meters) from others.
8. Household contacts do not need to distance from each other unless they are sick or they have to have very important things.
9. Wash your hands often with soap and water for at least 20 seconds, especially after using the washroom and when preparing food, use alcohol-based hand sanitizer if soap and water are not available.³⁹
10. When coughing or sneezing cough or sneeze into a tissue or the bend of your arm, if you have tissue paper dispose of the tissues you have used as soon as possible in a wastebasket and wash your hands afterward.
11. Coronaviruses can be easily killed by the use of disinfectants. The simple use of household bleach can be done, Bleach solution should be prepared according to the instructions on the label or in a ratio of 1 teaspoon (5 mL) per cup (250 mL). Directions are based on bleach that is 5% sodium hypochlorite, to give a 0.1% sodium hypochlorite solution. These surfaces that have to disinfect are the toys, toilets, phones, electronics door handles, bedside tables, television remotes.⁴⁰

8. Conclusion

As the known fact that coronavirus has become pandemic after the H1N1 (swine flu) which created a disaster has now crossed more than that. There is no appropriate vaccine for coronavirus approved by WHO. All the drugs are under clinical trials, The Government of India has used ayurvedic, Unani, homeopathic as preventive measures but it can't be used to treat the virus. The use of hydroxychloroquine, ED-

2801, and plasma exchange method are under clinical trials. If the trials give good results it will take nearly 12-16 weeks for the vaccine to come. Always the prevention is better than cure so proper hygiene maintenance is the key treatment and social distancing.

9. Source of Funding

None.

10. Conflict of Interest

None.

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Shaik Ali Hassan Dental Surgeon

Geetika Arora Reader

Author biography

Sumit Bhateja HOD

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