



TARGETED AND INVESTIGATIONAL DRUGS; OVERVIEW OF COVID – 19 PANDEMIC

Devsan Bhakti A1* ,Avhad Nikita K. , ChavanJyoti B.

1. MatoshriMirataiAher College Of Pharmacy , KarjuleHarya , Parner , Ahmednagar , 414304

Abstract :-

In december2019 observed a novel COVID -19 virus in the Wuhan city of China. Further scientist worldwide started discovering medications for this pandemic SARS-COV-2 . It novel severe acute respiratory syndrome corona virus 2 (SARS-COV-2) which has challenged to invent effective drugs for prevention and treatment . Review describes pharmacology of all medications drugs used to treat novel COVID -19.

Observation :-

There is no proven therapy for this infection currently in existance .Remdesivir is one of the promising therapy for this virus , it has potent in vitro activities against SARS-COV-2 . Remdesivir is not approved by US Food and Drug Administration (FDA) but still ongoing trials are tested.

Keywords :- Corona virus , COVIS-19 , Hydroxychloroquinone , Favipiravir, COVID -19 pandemic.

Introduction :

SARS-COV-2 is the severe acute respiratory syndrome. In December 2019 unknown cause of pneumonia case identified in Wuhan city of China .

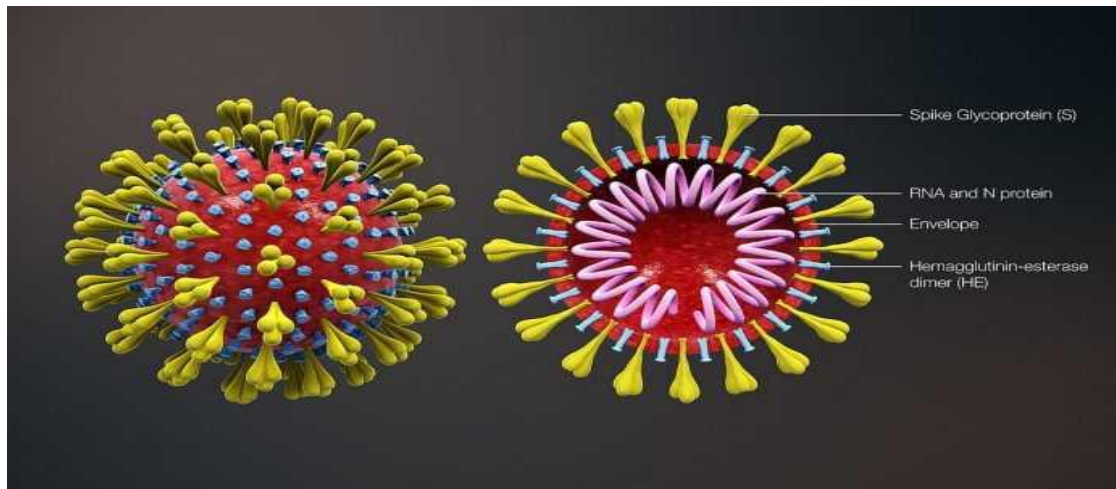
In January 2020 this previously unknown virus was named corona virus , this name was given by WHO [World Health Organization] in Feb. 2020.

In April 5, 2020 there are over 1.2 million of cases were identified and around 69000of deaths over the 200 countries .

In May 2020 over 4444670 cases were identified.

Corona virus is the viruses transmitted from animals to humans .

Corona virus refers to family *Coronaviridae* (order - *nidovirales*)



Symptoms of COVID -19 are as follows:

- 1) Fever
- 2) Cough
- 3) Shortness in breathing
- 4) Breathing difficulties
- 5) Fatigue
- 6) Sore throat

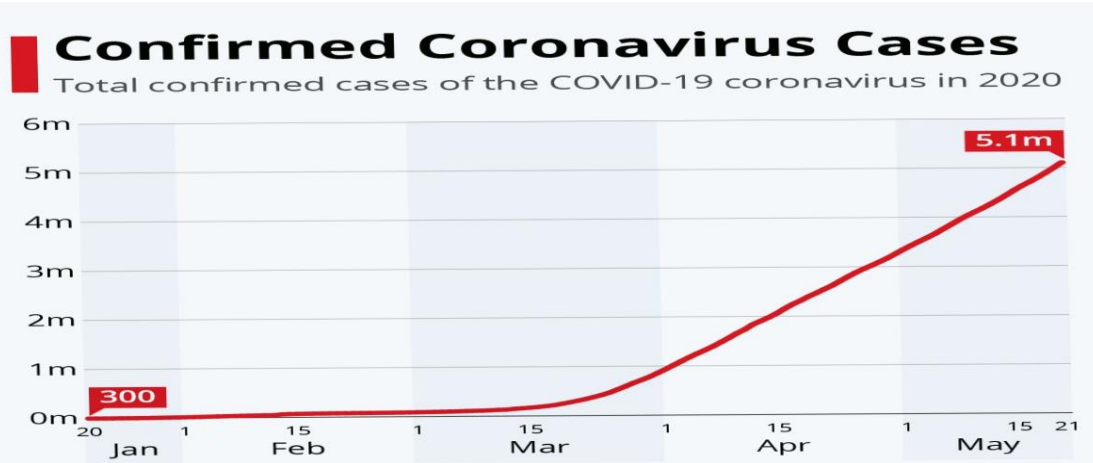
This virus infects people from of all ages . Two groups have higher risk of getting infected by COVID -19 are,

- 1) People over 70 years
- 2) People having serious chronic illness

Such as,

- 1) Cardiovascular disease
- 2) Diabetes
- 3) Chronic liver disease
- 4) Hypertension
- 5) Cancer

Person can be infected by the virus if person is within the close proximity of someone who is infected by COVID-19.



as 2019 pandemic.

Some of the medications used for COVID -19 and some adjunctive therapies are discussed in [this article](#).

Review for selected reprocessed drugs:-

1) Chloroquinone / Hydrochloroquinone :-

Hydroxychloroquinone-

Formula – $C_{18}H_{26}ClN_3O$

Molecular mass - 335.872 gm/mol

Chloroquinone having a deep down history in the prevention and treatment of malaria of chronic inflammatory disease. Hydroxychloroquinone has EC50 for SARS – COV-2 with invitro activities compared to chloroquine after 24 hours.

500 mg twice or once a day is given to patient of chloroquinone. Recommendation SLE is 400 mg /day. Till the date no adverse effect has been reported. Hydroxychloroquinone is safe during pregnancy. 588 patients tested in 12 review studies there is no infant ocular toxicity found during pregnancy.

Hydroxychloroquinone is effective for malaria but shows side effects like hypoglycemia, neuropsychiatric, retinopathy.

2) Ribavirin :-

Ribavirin inhibits viral RNA – dependent RNA polymerase it is a guanine analogue. To treat SARS – COV -2 necessary high dosage approximate 1.2 gm to 2.4 gm orally every 8 hours and combination therapy.

During treatment of SARS – COV – 2 ribavirin was given in the combination of IFN – a2b or IFN – a2a to give two mechanisms of antiviral activities.

Clinical experience of ribavirin revealed in 26 of the 30 studies. In remaining 4 studies it showed adverse effect as hematological and liver toxicity.

In SARS trials 60% of patient resulted in hematological anemia because of use of very high dose dependent hematological severe dependent hematological toxicity. It also shows contraindication in pregnancy.

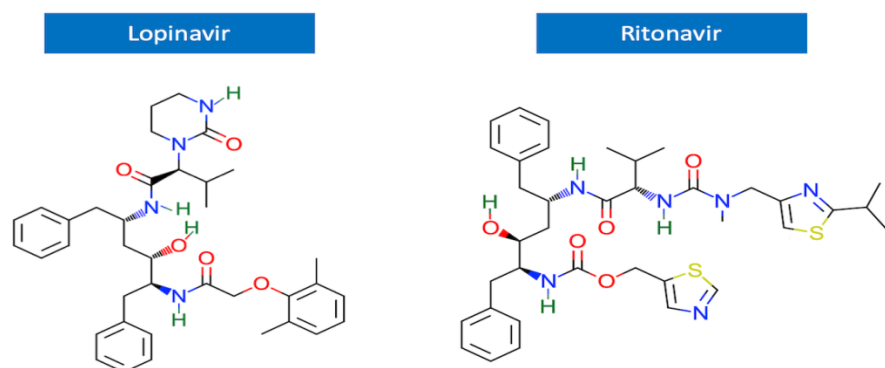
In middle east respiratory syndrome (MERS) It is used in combination with interferons. If ribavirin is used with combination it provides best for clinical efficacy.

3) Lopinavir / Ritonavir :-

Lopinavir is antiretroviral. It is from the protease inhibitor class. It is used to treat HIV with the combination of Ritonavir in fixed dose.

This treatment is known as highly active antiretroviral therapy (HAART) .This oral combination for HIV is appropriate by US Food and Drug Administration (FDA)

400 mg dose twice / day orally is given to patient .



Review for investigational drugs :-

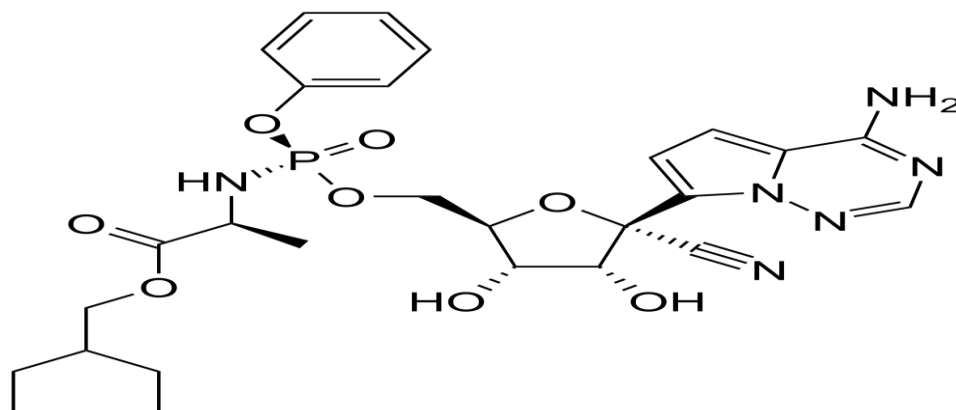
1) Remdesivir :-

Remdesivir is known as GS – 5734 . It is an monophosphate product undergoes metabolism to activate e – adenosine nucleoside triphosphate analogue. During ebola virus outbreak EC 50 worked selectively against ebola virus currently remdesivir is the promising therapy for COVID -19 .

Currently dose under investigation is single 200 mg dose , followed by 100 mg daily infusion .

Remdesivir is not recommended to the patients having glomerular filtration rate (GFR) less than 30 ml / min . This drug is clinically first used for treatment of ebolavirus .

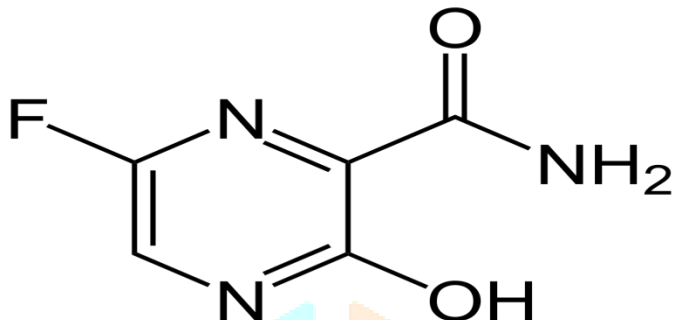
Use of remdesivir during COVID -19 have been reported successfully in the investigation. Remdesivir shows superior patients recovery suffering from COVID – 19.



2) Favipiravir :-

Favipiravir is also named as T - 705 . It is a product of purine nucleotide . It inhibits RNAPolymerase . In the investigation drug for COVID -19 recommended drug for patient is 2400 mg to 3000mg after every 12 hours twice a day. Favipiravir has limited clinical experience .

This drug is affected against influenza and ebola . It also shows activity against SARS – COV -2 having EC 50 .



Supportive Therapies :-

1) Corticosteroids :-

The use of corticosteroids is to decrease the host inflammatory response in lung which may lead to acute respiratory distress syndrome (ARDS) and lung injury . It can cause adverse effect including the risk of secondary infection and delayed viral clearance . Corticosteroids had the limited direct evidence in COVID – 19 . Observational studies in patients with SARS and MERS reported no association of corticosteroid with improved survival but demonstrated with delayed viral clearance from the blood and , respiratory tract and high rates of complications including psychosis , hyperglycemia of avascular necrosis . In ARDS and septic shock efficacy of corticosteroids more generally remains debated .

2) Anticytokine :-

Monoclonal antibodies directed against key of inflammatory cytokines and the innate immune response represent potential class of adjunctive therapies for COVID -19 . The use of anticytokine underlying pathophysiology of significant organ damage in lungs and other organ caused by an amplified immune response .

3) Immunoglobulin Therapy :-

Adjunctive therapy for COVID – 19 is use of convalescent or hyper immunoglobulins . In this treatment antibodies from recovered patient may help with both infected cell immune clearance and free virus . In SARS and MERS the anecdotal reports protocols for plasma have been reported as salvage therapy. The most effective long term strategy for long term prevention of future outbreaks of this virus would be the development of vaccine providing protective immunity . A minimum of 12 to 18 month would be required before wide spread vaccine development .

Conclusion :-

This article is written to get knowledge about SARS – COV -2 which is spreading all over the world. Article has information about ongoing clinical trials , investigation drugs and supportive therapies for corona virus . It has information about clinical trials to prepare vaccine and effective therapy to fight against corona virus . Remdesivir is the drug which shows the potential effect against corona virus .

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