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## COVID-19-OUT BREAK OF DISASTER

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### Abstract:-

Corona virus a deadly disease (2019) since December 2019 covid caused a global outbreak of illness related to respiration which is known as corona virus disease. Covid-19 is a group of single stranded viral genome (RNA) world health origination declared covid -19 as pandemic outbreak. There are various varieties of this deadly disease. But mostly six are very dangerous for the human. Corona virus belong to family "Corona Viridae" which can cause a lot of human as well as animal disease. In this given paper a lot of information unintended consequences of covid-19 mitigation measures and other complex health issues were considered and all possible information about corona virus were discussed.

**Keywords:-** Covid-19, Corona, Pandemic, Respiration, Various, deadly, Diseases, Dangerous.

### Introduction:-

The Covid-19 pandemic in march 2020,WHO declared covid a pandemic and called for governments to take some fast step to decrease bind prevent its spreading speed. This leads to various measures like, (hygiene, lockdowns, school closures, travel restrictions, and lot) were taken to save lives. It was firstly reported in wuhan china (2019) . Near November 2020 cases reached to millions and more spreading like a fire in forest. (SARS Cov) was the first (MERS-COV) was the second and (n Cov) is the 3<sup>rd</sup> type of this pandemic to infect humans in large scale with in last 2 decades<sup>1-2</sup>

### Microbiology:-

Corona viruses are RNA virus having extensive range of hosts and affect multiple system. Covid-19 possess an unsegmented single stranded RNA genome of about 30kb enclosed in a 5 cap and 3<sup>-</sup> poly (A) tail<sup>3</sup>. These viruses are encircled with envelope containing. Nucleocapsid in helical symmetry<sup>4</sup>. It form a crown like appearance when seen under microscope<sup>5</sup> mostly spherical in its shape with a covering of glycoprotein. Corona virus cause major health issues in human beings. It is also very harmful to animals. It can cause serious infection in respiratory tract and damage to the kidneys in chicken<sup>6</sup>.

### Replications of Corona viruses:-

Corona virus not only infect humans, it infects mammals, livestock and other animals, and are therefore not only a danger for public but animals health too. Coronavirus mainly express and replicate its Genomic RNA into cells via 2 spike protein subunits, which have different functions. The S1 and S2 subunits

S1 subunit-----ACE2 attachment through receptor domain

S2 subunit-----Fusion peptide and transmembrane domain

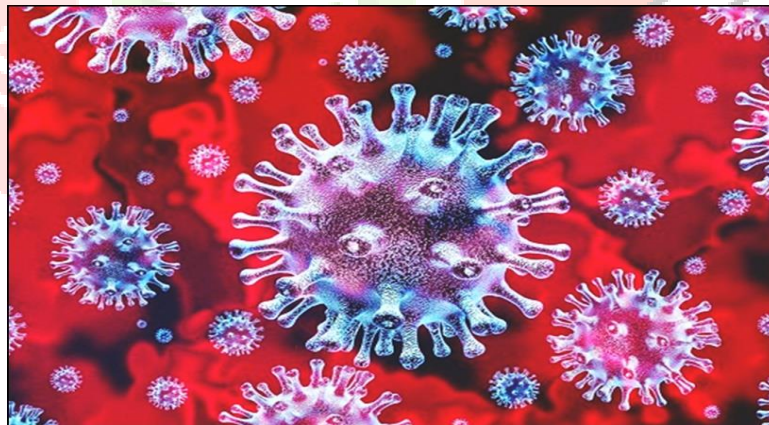
Cleavage occur (along the border of s1 and s 2 subunits) so infection depend on the proteases availability. After reaching cells, virus release its RNA with 7 genes. Genes one by encodes i.e. 1 gene encodes 20 RF which translate 2 polypeptides in returns. There polypeptides have 16 units. There 16 units/Proteins form double membrane vesicles, and this is the target side of viral replication and transcription<sup>7-9</sup>.

### Body immune response:-

Interferons play key role in immune response. Virus infected cell start secreting interferons molecules that start binding to cell receptor and triggers JAK/STAT pathway and activate many antiviral genes and then get transcribed into the RNA and proteins this result in the suppression of viral spread<sup>10</sup>.

### Spread and transmission:-

Firstly wuhan in city of china lot of patients with pneumonia has reported with unknown factor common cases have a common source i.e. sea food. It was known to be spreaded via sea food market. After that reports reveals, it spread from human to human, than reports revers, it spreads from infected to healthy person via contact<sup>11</sup>. But on 31<sup>st</sup> December china informed and cleared the fact to WHO about the outbreak of this pandemic disease and the virus is known as coronavirus which is similar to bat coronavirus. There was a huge increase in number of cases and it affected other person too without any contact<sup>12-13</sup>. Transmission via bats are also reported. Ebola virus that is spreaded via bats have 96% similarity with coronavirus. After all the reports and analysis it is informed that virus spread via droplets (blood etc).



**Fig:-Corona Virus**

### Transmission of SARS-COV-2<sup>14</sup>:-

Can occur through direct or indirect contact with infected person, infected secretions or respiratory droplets (Saliva, cough, Sneezes)

Sign and symptoms

Symptoms are as follows: -

- a) Dry cough
- b) Fever (99% patient)

- c) Sore throat
- d) Headache
- e) Tiredness
- f) Loss of taste and smell
- g) Diarrhea
- h) Respiratory issue
- i) Conjunctivitis
- j) Rash/ discoloration of fingers
- k) Shortness of breath
- l) Loss of speech
- m) Chest pain
- n) Chills
- o) Muscle pain

**Diagnosis:-**

Patient with any one of the above mentioned symptoms are kept under medical care for days, when a case is confirmed with tests such as sputum, oropharyngeal swab, blood test, etc. Collected sample sent to lab and then certified by the government testing of coronavirus. Transportation of sample should be done at 4°C. In many cases the WBC count is less, Increase in the level of procalcitonin reveals bacteria infection C.T also act as a useful tool in diagnosing corona presence. Platelets count in corona infection is unaffected. The collection of sample, Testing of sample shows be under government guidelines<sup>15</sup>.

**Prevention:-**

Its better to be safe than to be sorry. Following are the precautions or ways to prevent corona.

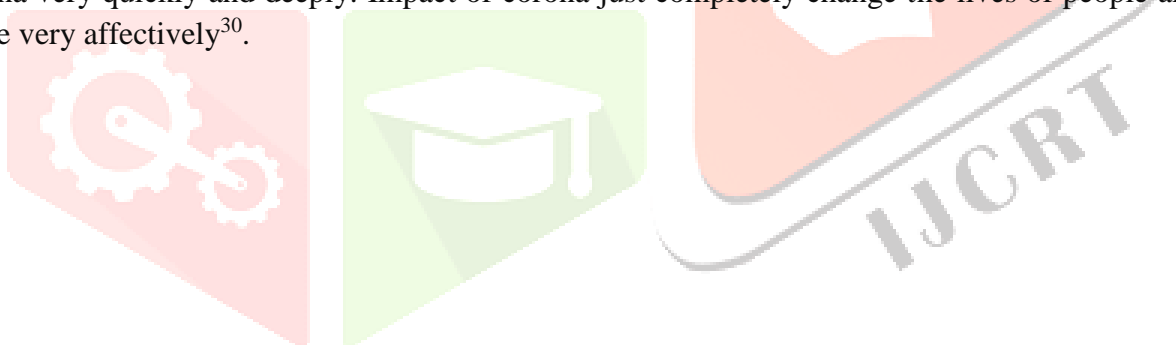
1. One must always wash hands with hand wash, Soap regularly.
2. Washing reduce chance of transmission.
3. When hands are unwashed avoid, touching the face, nose, eyes and no close contact with the people.
4. Limiting social gatherings there must be a distance of 1m between two people.
5. Occasion like parties, devotion in temples, marriages, should be reduced or banned are limited.
6. Use of face mask should be must hands must be sanitized, musk must be on the face to cover nose and mouth.
7. Don't use disposal mask twice<sup>16-17</sup>
8. Use of personal protective equipment is very important for preventing transmission of disease like use of PPE kit. There kit have mask gowns, head gear, goggles, gloves, and are very expensive.

**Impact:-**

1. On education system
2. Mental health
3. Agriculture
4. Healthcare
5. Sports
6. Tourism<sup>18</sup>

**Pharmaceutical Industry: -**

In the case of education, Various school, colleges, Universities, are badly affected. Online classes are there but not with that much efficiency, lesson plans have been prepared for good classes work. Like reports, project files, assessment are given to student over online methods<sup>19</sup>.Semester exams are almost impossible to conduct many universities, schools promotes student on there previous performance<sup>20</sup>.Online exams cannot ensure integrity of the exams<sup>21</sup>.Other students from other countries also face lot of problems due to improper transportation. Students miss practicals project submission on time. Lot of loss to education system<sup>22-23</sup>. Covid disturb the lives of people all over the world, Fear causes so many mental issues to various people around the globe. Corona disturb everyone life in one or another way, which ultimately reduce their balance and disrupt their mental peace and health<sup>24-25</sup>. Agriculture crushed very badly demands for vegetable fruits and other essential just get crushed very quickly lockdown and closure affected the demand of agriculture products due to low demand prices also get low and farmers suffer very badly<sup>26</sup>. Tourism, Sports are affected too in large scale due to corona<sup>27-29</sup>. Each and everything from small to big get effected by corona very quickly and deeply. Impact of corona just completely change the lives of people arounds the globe very affectively<sup>30</sup>.



**Corona virus state wise data of India from 31 MARCH, 2021:-**

In India the corona virus cases are spreading like a forest fire taking every thing in its range and affecting more than 75,000 people per day<sup>31</sup>.

<b>COVID-19 STATE WISE STATUS, 31MARCH. 2021<sup>32</sup></b>				
<b>S.No.</b>	<b>State Name</b>	<b>Confirmed Cases</b>	<b>Cured Cases</b>	<b>Deaths</b>
1.	Andaman and Nicobar Island	5081	4976	62
2.	Andra Pradesh	900805	886978	7213
3.	Arunachal Pradesh	16845	16785	56
4.	Assam	218363	215413	1104
5.	Bihar	265268	262238	1574
6.	Chandigarh	26733	23523	379
7.	Chhattisgarh	344624	318436	4131
8.	Dadra and Nagar Haveli & Daman and Diu	3642	3474	2
9.	Delhi	660611	642166	11016
10.	Goa	57839	55591	829
11.	Gujrat	305338	288565	4510
12.	Haryana	289694	277110	3147
13.	Himachal Pradesh	63320	59445	1045
14.	J&K	130587	126304	1990
15.	Jharkhand	123508	120141	1113
16.	karnataka	992779	954678	12541
17.	Kerala	1121931	1092365	4606
18.	Ladakh	10119	9767	130
19.	Madhya Pradesh	9338	174202	3115
20.	Maharashtra	2773436	2377127	54422
21.	Meghalaya	14056	13861	150
22.	Odisha	340620	336930	1921
23.	Puducherry	41341	39648	682
24.	Punjab	236790	206246	6813
25.	Rajasthan	332243	321275	2813
26.	Tamil nadu	884094	856548	12700
27.	Uttarakhand	100118	96709	1713
28.	Uttar Pradesh	615996	598001	8800
29.	West Bengal	585933	570303	10327
30.	Lakshadweep	718	678	1
31.	Manipur	29393	28952	374
32.	Mizoram	4473	4434	11
33.	Madhya Pradesh	293179	273168	3977
34.	Nagaland	12233	12134	92
35.	Telengana	307889	301227	1697
36.	Tripura	33503	33055	392

Vaccines should be manufacture in huge quantities and should be safe and effective. Which can face the unpredictable challenge. Every step of vaccine production should be well analyzed and evaluated. Various effective vaccine for Covid-19 were developed which can produced protection against disease.

### **Treatment for Covid-19<sup>33-40</sup>:-**

Various treatment for patients to receive a new. Potential treatment with no other options are available, FDA issue (EVA) to help patients and public to make new medications and medical products.

1) Remdesivir (Veklury):- It is an antiviral given iv infusion in the hospital on 22,2020, the FDA approved it for treatment of Covid-19 patients (age-12 and older). It is also being studied in combination with other medication. Not all studies have been promising with Remdesivir. Some for 10 days and got mixed result overall. A study of 236 patients with covid-19 in china didn't worked well. This above research and researchers state that larger studies are needed to confirm better result.

2. Dexamethasone: - It is steroid in nature and used in curing various health issues and giving this medication to patient found that there was a lower death rate at day 28 in 2019. Patients with covid-19 which got dose of dexamethasone.

3. Convalescent plasma: - FDA on 24 march 2020 issued an EIND to treat Covid-19 and than transfused it to a Coronavirus active patient. It is found that antibodies in convalescent plasma can help fight infection. Rarely data from a mayo clinic study of over 55,000 hospitalized patients with Covid-19 who get this treatment. But in future they didn't get enough evidence to recommend the different doses, different patient, at different timing were given and observed (low quantity result)

4. Monoclonal antibodies: - Antibodies are proteins bind to pathogens and destroy them. MABs are ab. made in lab. Which are higher in fighting infection.

5. Bamlanivimab: - This medication was designed to block the SARS-Cov-2 virus from entering and infection human cells. Eli Lilly reported in an early analysis that this medication can provide mild to moderate response. Three different doses were tested by him higher doses proved good but not them lower doses on the other hand. Then he performed combined study, combination of two MABs there studies are still ongoing and find result not yet available.

Substance like kinase inhibitors, interferons, Kaletra, ivermectin were also used for providing immunity to patient but result was mixed.

Traditional method like use of Curcumin, Xanthorrhizol were also under study to be provide beneficial for curing Covid-19 patient. These two are widely used as a medication and supplement for specific diseases they have various properties like:-

- a) Anti-inflammatory
- b) Anti-cancer
- c) Anti-microbial
- d) Anti-hypertensive etc.

The studies show that Xanthorrhized treatment inhibit inflammatory cytokine production in adipose tissue and tumor necrosis factor. This can interrupt various pathway related to RAA system. Herbals agent act useful in treatment of Covid-19 suggestion for the patients is that still not recommended to heal the disease without any specific advice<sup>41-45</sup>.

## Summery of Covid-19 treatment:-

Agent	Target	Adult dose/Administrations	Contraindicatio n	Toxicities	Major drug-drug interactio ns	Special Populations
<b>Repurposed agents</b>						
Chloroquine phosphate <sup>46-52</sup>	Blockade of viral entry by inhibiting glycosylation of host receptors, proteolytic processing, and endosomal acidification. Additional immunomodulatory effects through inhibition of cytokine production, autophagy, and lysosomal activity in host cells	500 mg by mouth every 12-24 h × 5-10 d. Available as: 250-mg tablets (salt); 500-mg tablets (salt); 500-mg tablets of chloroquine phosphate (salt) = 300-mg chloroquine base. Dose adjustments: Kidney: Creatinine clearance <10 mL/min administer 50% of dose. Hepatic: No dose adjustments in hepatic impairment recommended; use with caution. Administration: Preferable to avoid crushing. If needed, may be crushed and mixed with jam, pasteurized yogurt or similar foods	Hypersensitivity to chloroquine, 4-aminoquinoline compounds, or any component of formulation. Presence of retinal or visual field changes of any etiology (unless benefit outweighs risk)	Common: Abdominal cramps, anorexia, diarrhea, nausea, vomiting. Major: Cardiovascular effects (including QTc prolongation), hematologic effects (including hemolysis with G6PD deficiency, use if benefit outweighs risks), hypoglycemia, retinal toxicity, neuropsychiatric and central nervous system effects, idiosyncratic adverse drug reactions	CYP2D6 and CYP3A4 substrate	May be used in pregnancy if benefit outweighs risks
Hydroxychloroquine sulfate (Plaquenil/generic) <sup>53-58</sup>	Hydroxychloroquine shares the same mechanism of action as chloroquine	400 mg by mouth every 12 h × 1 d, then 200 mg by mouth every 12 h × 4 d; alternative dosing: 400 mg by mouth daily × 5 d or 200mg by mouth 3 times/d for 10 d. Available as: 200-mg tablets of hydroxychloroquine sulfate (salt) = 155 mg hydroxychloroquine base. Dose adjustments: No kidney or hepatic dose adjustments recommended; use with caution. Administration: Manufacturer does not recommend crushing tablets; however, some sources suggest that tablets can be crushed and dispersed with water OR compounded into an oral solution	Known hypersensitivity to hydroxychloroquine, 4-aminoquinoline derivative, or any component of the formulation	Adverse drug reactions similar to chloroquine but less common	CYP2D6, CYP3A4, CYP3A5, and CYP2C8 substrate	May be used in pregnancy if benefit outweighs risks
Lopinavir/ritonavir (Kaletra) <sup>59-64</sup>	3CL protease	400 mg/100 mg by mouth every 12 h for up to 14 d. Available as: lopinavir/ritonavir 200-mg/50-mg tablets; lopinavir/ritonavir, 100-/50-mg tablets; lopinavir/ritonavir 400-mg/100-mg per 5-mL oral solution (can be given via feeding tubes compatible with ethanol and propylene glycol, contains 42% alcohol). Dose adjustments: No kidney or hepatic dose adjustments	Hypersensitivity to lopinavir/ritonavir or any of its ingredients, including ritonavir. Co-administration with drugs highly dependent on CYP4503A. Co-administration with potent CYP450 3A	Common: gastrointestinal intolerance, nausea, vomiting, diarrhea. Major: Pancreatitis, hepatotoxicity, cardiac conduction abnormalities	CYP3A4 inhibitor and substrate; CYP2D6 substrate; CYP1A2, CYP2B6, CYP2C8, CYP2C9, CYP2C19 inducer. P-gp substrate; UGT1A1 inducer	May be used in pregnancy; avoid oral solution if possible due to ethanol content

		recommended; use with caution in hepatic impairment. Administration: Food restrictions: Tablets, take without regard to meals; oral solution take with food. Do not crush tablets; oral solution not recommended with polyurethane feeding tubes	inducers			
Umifenovir (Arbidol) <sup>65-66</sup>	S protein/ACE2, membrane fusion inhibitor	200mg every 8 h by mouth 7-14 d. Available as (not in the US): 50-mg and 100 mg tablets, capsules and granules. Dose adjustments: Kidney: no dose adjustment necessary. Hepatic: No specific recommendations available caution in those with hepatic impairment. Administration: Bioavailability 40%	Known hypersensitivity to umifenovir	Allergic reaction, gastrointestinal upset, elevated transaminases	Metabolized by CYP3A4, monitor with strong inducers/inhibitors	Contraindicated in children <2 y of age (increased sensitivity)
<b>Investigational agents</b>						
Remdesivir <sup>67-69</sup>	RNA polymerase inhibitor	200 mg × 1, 100 mg every 24 h IV infusion. Available as: 5-mg/mL vial (reconstituted). Dose adjustments: Kidney: Not recommended for GFR <30. No kidney/hepatic dose adjustment currently recommended but holding doses may be considered if significant toxicities occur. Administration: 30-min IV infusion	Exclusion criteria based on specific protocols	Elevated transaminases (reversible), kidney injury	Not a significant inducer/inhibitor of CYP enzymes, monitor with strong inducers/inhibitors	Safety in pregnancy unknown, currently recommended to avoid
<b>Agent</b>	<b>Target</b>	<b>Adult dose/Administrations</b>	<b>Contraindication</b>	<b>Toxicities</b>	<b>Major drug-drug interactions</b>	<b>Special Populations</b>
Favipiravir <sup>64</sup>	RNA polymerase inhibitor	Doses vary based on indication limited data available. Available as (not in the US) 200-mg tablet. Dose adjustments: Kidney: no dose adjustment recommended, limited data available, Hepatic: Dose adjustment considered in Child-Pugh C, increased exposures observed in Child-Pugh class A to C. Administration: Tablet can be crushed or mixed with liquid, bioavailability >95%	Exclusion criteria based on specific protocols	Hyperuricemia, diarrhea, elevated transaminases, reduction in neutrophil count	CYP2C8 and aldehyde oxidase inhibitor, metabolized by aldehyde oxidase and xanthine oxidase	Contraindicated during pregnancy, metabolite found in breast milk
<b>Adjunctive therapies</b>						
Tocilizumab (Actemra) <sup>66-67</sup>	IL-6 inhibition- reduction in cytokine storm	400 mg IV or 8 mg/kg × 1-2 doses. Second dose 8-12 h after first dose if inadequate response. Available as: IV infusion injection: 80 mg/4 mL	Known hypersensitivity to tocilizumab or any components of the formulation. Caution in patients	Common: Increase in upper respiratory tract infections(including tuberculosis), nasopharyngitis,	In vitro data suggested that IL-6 reduces mRNA	Safety in pregnancy unknown; may cause harm to the fetus



	(20 mg/mL); 200 mg/10 mL (20 mg/mL); 400 mg/20 mL (20 mg/mL) in single-dose vials for further dilution prior to IV infusion. Dose adjustments: Kidney: No dose adjustments recommended in mild or moderate kidney impairment. Not studied in patients with severe impairment. Hepatic: No dose adjustments Recommended (not studied); initiate based on benefit. Administration: Infuse over 60 min, should not be infused concomitantly in the same IV line with other drugs	with neutropenia (<500 cells/ $\mu$ L) or thrombocytopenia (<50 000/ $\mu$ L)	headache, hypertension, increased AST, infusion related reactions. Major: Hematologic effects, infections, hepatotoxicity, gastrointestinal perforations, hypersensitivity reactions	expression for several CYP450 isoenzymes, including CYP1A2, CYP2B6, CYP2C9, CYP2C19, CYP2D6, and CYP3A4. May decrease levels of substrates	
Abbreviations: ACE2, angiotensin-converting enzyme 2; AST, aspartate aminotransferase; 3CL, 3-chymotrypsinlike; COVID-19, coronavirus disease 2019; CYP, cytochrome P450; G6PD, glucose-6-phosphate-dehydrogenase;			GFR, glomerular filtration rate; IV, intravenous; P-gp, P-glycoprotein; UGT1A1, UDP glucuronosyltransferase family 1 member A1.		

### Conclusion:-

The quick emerging danger outspread is affecting use in lot of ways. It is a challenging problem for cell the people, Previously only china was experiencing this virus attack and now the whole world is undergoing such deadly virus disease. There must be some medicine, vaccines, Technology, to fight to prevent these deadly pandemic outbreak. Which slowly but completely affect all the social, Physical, Mental, economic, health of country in large scale. This responsibility should also followed by the people of the country by following the rules, Guidelines of the government regarding this alarming problem worldwide.

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