Review Article

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REVIEW ON THE PHARMACOLOGY OF THE DRUGS USED FOR COVID-19 OUTBREAK

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ABSTRACT:

BACKGROUND & OBJECTIVE: The recent global health threat is the outbreak of a viral infectious disease caused by SARS-COV2 (Severe acute respiratory syndrome-corona virus). The origin of this outbreak is from the animal market in Wuhan, China. So, it is considered as zoonotic in origin as its mode of transmission is from animals to human. This outbreak is similar to previous outbreaks of coronavirus like SARS-COV (Severe Acute Respiratory syndrome) and MERS-COV (Middle East Respiratory Syndrome). Until now different pharmacological drugs have been used to mitigate the symptoms of the COVID-19 throughout the world. There is no specific medication prescribed as the treatment of this disease. However, pharmacological drugs and immune boosting dietary therapies have been proved effective in treatment strategies.
METHODOLOGY: The latest epidemiological articles, research articles, review articles, WHO guidelines and news proceedings are selected in this review. Articles were searched under the keyword search of COVID-19, drugs for COVID-19, latest COVID-19 research, surveys for covid-19. PubMed, Lancet, Elsevier, BMJ and CDC were used to accumulate the latest findings.
RESULTS: There is no vaccine or other proper treatment available for this infectious disease but the symptomatic treatment is usually given to the infected person as the use of certain pharmacological as well as traditional drugs are given to reduce the symptoms associated with this disease. Furthermore, COVID-19 serious patients on ventilator are treated with the plasma therapy as with the antibiotics from the plasma of recovered patients is also in use to reduce mortality rate.
CONCLUSION: To prevent this infectious disease it is important to avoid the person-to-person transmission which is mainly via coughing, sneezing, droplets of the respiration, direct contact with the infected person. So, the social distancing and self-quarantine is preferred to avoid the spread of this infectious disease. The drugs which are commonly used to reduce or eliminate the symptoms of COVID-19 are Paracetamol, Aspirin/Loprin, Dabigatran, Azithromycin, Famotidine, Ipratopium bromide, Dexamethasone,Tocilizumab, and Moxifloxacin. These drugs have been practiced by the practitioners to treat the symptoms of covid-19. However no pertinent drug has been approved as a cure of covid-19.
KEYWORDS: MERS-COV, SARS-COV, Infectious Disease, Mortality rate, Quarantine.

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INTRODUCTION:

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Coronavirus is a type of viral disease that mainly affects the respiratory system of human beings. Preceding outbreaks of the coronaviruses (CoVs) embrace (SARS)-CoV the Severe acute respiratory syndrome along with (MERS)-CoV the Middle East respiratory syndrome that have been formerly considered to be the agents of the disease and a threat to public health[1]. In December 2019, a huddle of the people infected with this viral infection got admitted in the hospitals having the preliminary verdict as of pneumonia with an indefinite etiology. The infected individuals were considered as they must be associated towards the seafood as well as damp animal market present in Wuhan, Hubei Province, China with pathological symptoms.

The establishment or occurrence of COVID-19 which is called as chronology of this infectious disease is as this. The foremost cases were known to be reported in December 2019. Commencing from 18th December all the way through 29th December 2019, 5 patients that were infected with this infectious disease were hospitalized in the midst of acute form of the respiratory agony condition furthermore one in those admitted patients died. By January 3, 2020, 40 patients got admitted in the hospital and all of them were identified to be COVID-19 infected patients by the laboratory confirmation and just few of them had co-morbidities like cardiovascular disease, hypertension, cancer, asthma etc. it was considered that these patients might be infected due to the hospital acquired infections (NOSOCOMIAL). It was presumed that this infection might be transmitted from one person to other person through various means like by air droplets, coughing, sneezing, by getting close to an infected person.

At beginning only patients with symptoms were checked clinically or by the hospitals to be infected but those with asymptomatic but turned out that infection was also a leading cause of its spread because they did not know that they are infected or not. In January 22, 2020, about 570 cases of this new infection were reported in different provinces of China. On January 25, 2020, there were about 1975 cases were inveterate to be tainted by means of the COVID-19 within mainland of China and with the increase in mortality rate. After this to other confirmed reports suggested that about 5500 cases were present in China till the end of January, 2020. After this the cases were also reported from other countries too and the infected countries are as follows Thailand, Taiwan Malaysia, Sri Lanka, Vietnam, Nepal, Japan, Cambodia, Singapore, Italy, Republic of Korea, France, and Germany. Due to the emergence of the COVID-19 cases WHO, declared it as pandemic in March19, 2020. The virus of COVID-19 has turned out to be the main pathogens of rising the respiratory syndrome outbreaks. There is a large family of the single stranded RNA (+ssRNA) virus with the intention of as it could be secluded in diverse species of animal.

Due to its zoonotic origin, it can also spread disease from animals to human when in close contact with each other like those of SARS-COV and MERS-COV. Amusingly, these last viruses have possibly originated as of bats furthermore subsequently stirring into the other mammalian species acting as host for these pathogens.

Now, the strategies regarding the treatment of infected patients are just supportive because there is no confirmed medicine or vaccine available for this infection[2] . The other ways of reducing its chances to avoid social contact and the self-isolation at home can reduce the chances of its spread and also reduces the mortality rate.

The sign and symptoms of this infectious disease COVID-19 vary from mild to severe and at its peak severity where it mainly affects the lungs of affected person it may lead to death.

The symptoms appear after the incubation period which is the time between exposure and the appearance of first symptom is about 5.2 days. The epoch as of the inception of the COVID-19 symptoms in the direction of death is from 6- 41 days by means of a norm about 14 days. The onset of symptoms of the disease and the death period is age dependent and immune

status of the individual got infected. This period is shorter in the persons above 70 years of age then those under 70 years of age.

Some most frequent symptoms which are at inception of the COVID-19 infirmity are those as fever, fatigue as well as cough, whereas supplementary symptoms consist of sputum production, hemoptysis, headache, diarrhea, as well as lymphopenia. Clinical examination of the chest by CT scan exposed the pathological effect of the virus and appeared as in pneumonia. Some unusual features like acute cardiac injury, acute respiratory syndrome in addition to occurrence of the ground-glass opacities which is a leading cause of death were also observed.

In a number of infected patients, the various peripheral ground-glass opacities were also seen along with subpleural lung effusion. The inflammation of the lungs was triggered due to localized as well as systemic type of immune response that amplified the inflammation[3]. Unfortunately, in some cases the treatment by means of interferon inhalation appears to have no clinical consequences moreover it appears to exacerbate the circumstances by moving ahead to the pulmonary opacities. It is significant to memorandum with the intention of the fact that there must be some similarities in those of the symptoms flanked by the COVID-19 infection as well as former betacoronavirus like dry cough, dyspnea, fever, moreover as bilateral ground-glass opacities as in the CT scans of the chest. Conversely, COVID-19 appears to show various exceptional clinical experiences that embrace those of the affecting lower airway as obvious by means of the symptoms of the upper respiratory tract like, sneezing, rhinorrhoea along with the painful throat[4] .

The result obtained from the radiograph of chest also showed infiltrate in the upper lobes of lungs which may result in the occurrence of dyspnea as well as hypoxemia. The patients suffering from the infection of COVID-19 also developed the GI (gastrointestinal) symptoms as those of diarrhea and abdominal pain etc. Gastrointestinal symptoms were less likely to be associated with those MERS-COV or SARS-COV patients. Consequently, it is imperative to check fecal as well as urine samples in the direction of to eliminate an impending substitute means of spread, particularly from the health care workers as well as patients.

Some other symptoms as decrease in oxygen saturation the sore throat and coughing leads the patient to use oxygen or if in serious condition ventilator use may then be required to stable the patient's condition and the symptoms may get worse if not treated properly or the person is already suffering from some other chronic disease as co-morbidity may lead to the chronic conditions.

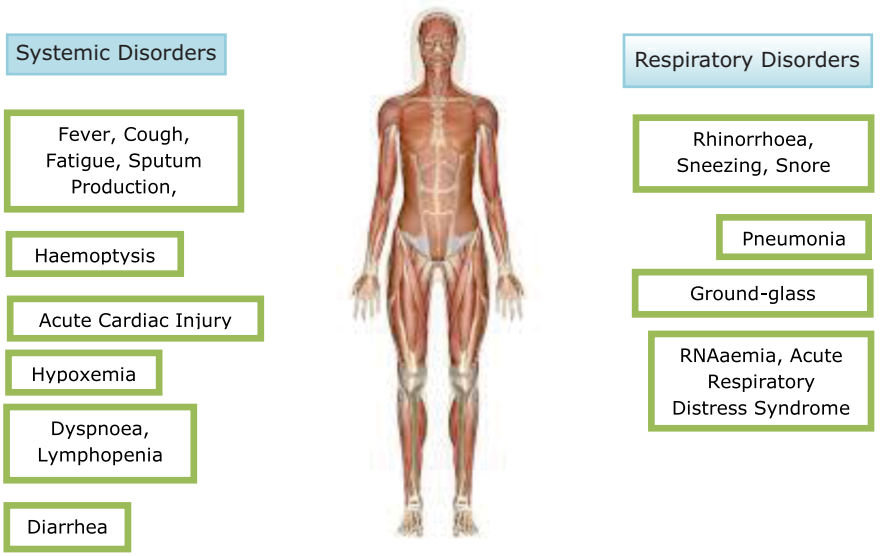

Figure-I: Diagram depicting signs and symptoms of corona virus.

The pathogenesis which explains the biological process or mechanism which leads to the disease state. The Patients tainted through COVID-19 showed to have the elevated numbers of the leukocyte as well as the anomalous findings of the respiratory tract, furthermore augmented levels as of the pro-inflammatory types of cytokines in the plasma. Some of the COVID-19 patient's reports give the conclusion as present with fever with those of cough loutish breathing sounds in both the lungs, along with the temperature of body as about 39.0 °C. The sputum of the patient presented with the positive synchronized polymerase chain reaction consequences so as to confirm the infection of COVID-19.

Furthermore, the elevated level of the C-reactive protein as with the value of about 16.16 mg/L which is exceeding the standard range of this C-reactive protein (0–10 mg/L)[5]. Also, the elevated ESR (erythrocyte sedimentation rate) as well as the D-dimer were also pragmatic.

The core pathogenesis that describes COVID-19 infection as the virus that targets the respiratory system with rigorous pneumonia, joint as by means of the occurrence of ground-glass opacities, RNAaemia, along with the cardiac injury that is cute in nature. Park M et al [6] Considerably higher levels of the cytokines along with chemokines in blood were eminent in the patients having COVID-19 infection and these included as IL7, IL1RA, IL8, IL1-β, IL9 and IL10 basic, GMCSF, IP10, GCSF, IFNγ, MIP1α, MCP1, PDGFB, MIP1β, TNFα, in addition to the VEGFA. The severe cases those who were in intensive care unit (ICU) also appeared with the elevated levels of the pro-inflammatory cytokines as those of the Rothan HA et al[7], IL7, IL2, IL10, IP10, GCSF, MCP1, MIP1α, as well as TNFα that are rational to endorse the severity of the disease.

CoVs is a virus with crown like in appearance (coranum a Latin name meaning crown) as it has the spikes of glycoprotein present on its shroud when seen under highly magnified electron microscope and it is a positive-stranded type of RNA virus. The subfamily having name as *Orthocoronavirinae* of the family named as *Coronaviridae* with order (*Nidovirales*) that is classified into the 4 different genera of CoVs as:, Betacoronavirus (betaCoV), Alphacoronavirus (alphaCoV), Gammacoronavirus (gammaCoV), Deltacoronavirus (deltaCoV). Moreover, the Betacoronavirus (betaCoV) genus is divided further into the 5 different lineages or sub-groups. Genomic description has also revealed that most likely bats as well as rodents are the genetic sources of the alphaCoVs along with betaCoVs. On the contrary, the avian species appears to signify gene sources as those of the deltaCoVs as well as gammaCoVs.

The members of this hefty family of the viruses can be a source of the respiratory, hepatic, enteric, along with those of the neurological disorders in diverse of animal species, together with those of camels, cats, cattle in addition to bats. Up to now, (HCoVs) human CoVs with seven different types are competent types of infecting humans have been recognized.

These types of viruses can lead to the common cold as well as self-limiting type of upper respiratory infections in the individuals having immune system capable of fighting against them (immunocompetent). In the individuals having weak immune system and could not compete the invading pathogens as immunocompromised in addition to the aged, the infections of the lower respiratory tract can arise. Other types of the human CoVs as SARS-CoV, SARS-CoV-2, in addition to MERS-CoV (betaCoVs of the B along with C lineage, correspondingly)[8] . They can be a source of the epidemics through inconsistent medical sternness with the features of respiratory along with extra-respiratory events. Pertaining to MERS-CoV and SARS-CoV, the transience rates are up to 11% and 36%, correspondingly.

Consequently, SARS-CoV-2 type of virus belongs to Van et al [9] the beta CoVs group. It has shape as may be round or elliptical furthermore it is frequently pleomorphic (occurrence in various distinct forms), moreover with the diameter about 60–140 nm. It is also sensitive to heat and UV (ultraviolet) radiations like other viruses from this group. The high temperature can also use to limit the replication of viruses. At present, the temperature that inactivates SARS-CoV-2 ought to be well explained and its inactivation temperature is about 31°C. In contrast, it may oppose the cold temperature yet underneath 0°C. Additionally, these types of viruses can be efficiently made inactivated by the lipid types of

solvents as chlorine-containing disinfectant, ether (75%), ethanol, chloroform along with, peroxyacetic acid etc. In genetic stipulations, have confirmed that new Driggin E et al [10] HCoV genome, secluded as of a number of patients having the pneumonia which is atypical as subsequent to having a visit to Wuhan, they had about 89% nucleotide characteristics similar by means of those as that present in bat SARS-like-CoVZXC21 along with 82% as those of human SARS-CoV that's why it is called SARS-CoV2. It has a RNA genome with 29891 nucleotides that encodes for those of 9860 amino acids. Possibly, a number of SARS-CoV-2 subsists. Even though the source of the SARS-CoV-2 is not completely tacit, but the genomic analysis put forward the evidence as the SARS-CoV-2 mainly evolved as of a strain present in bats[11]. The probable amplifying mammalian host, transitional between those of bats as well as humans, unknown. As the alterations in novel strain may possibly encompass unswervingly triggered to the virulence in the humans.

The infectious diseases can be transmitted from animal to the human and then further human to human transmission is also occurs. This transmission could be direct or indirect tin nature. But for SARS-COV2 we can explain this transmission is from animals to human (zoonotic) in nature due to the evaluation of the people working in animal market in Wuhan, China from where it actually spread. The researchers are trying to find the reservoir host or the intermediate carrier which is actually the cause of spread to human. But, to date, we are unable to find the reservoirs other than mammals along with those of birds[12].

Genomic succession investigation of COVID-19 gives the evidence that about 88% similarities with 2 bat-derived (SARS) coronaviruses, signifying that the mammals are for the most part have probable association flanked by COVID-19 with humans. Numerous reports have recommended that the transmission which is causative for spreading this infection is person-to-person transmission. This mode of transmission as Person-to-person transmission appears to occur mainly by means of the direct contact or may be all the way through the droplets spread by sneezing and coughing as of the infected person. But there is no transmission of the virus between mother and child either through placenta or via lactation in pregnant or lactating mother while female being effected[5]. This is significant as the pregnant mothers are comparatively supplementary vulnerable to infection by means of pathogens of respiratory tract along with severe pneumonia.

The binding of the receptor uttered through the cells of the host is the foremost step of this infection subseuent to union through cell membrane. It is consistent that the epithelial cells of the lungs are considered to be the target of virus. Therefore, it has been reported that the person- to- person transmissions as of the SARS-CoV mainly appears to be occur through the binding of spikes of the virus with receptors of the cell as (ACE2) angiotensin-converting enzyme 2.Significantly, the succession of the receptor-binding COVID-19 domain related in the direction of the SARS-CoV[13]. It also give the suggestion that entry and survival in the cell is via ACE2 receptors which facilitates its binding and also protect from harsh internal environment of body. And thus help in its survival in the body.

Treatment options:

At present there is no explicit antiviral or other types of treatment suggested for the COVID-19, furthermore, there is no vaccine presently existing. So, the way of treating the patient or the treatment option is symptomatic, as well as the oxygen (O2)[14] therapy appears to be the first option for addressing respiratory mutilation. So the invasive mechanical ventilation (IMV) as well as NIV (Non-invasive) mechanical type of ventilation might be indispensable in the cases of the respiratory collapse intractable to the O_2(oxygen) therapy. Over again, the intensive care is required to pact by means of those of the intricate forms of this infectious disease[15]. With reference to ARDS (Acute respiratory distress syndrome) treatment, gathering acquaintance on those of pathophysiology of damage to lungs, have steadily induced the clinicians to appraisal of the strategies required for managing the respiratory failure. ARDS which is induced from COVID-19 (CARDS) is not a "usual" ARDS. This characteristic related to the disease is of elementary consequence as well as has possibly

pessimistically exaggerated the remedial approach in the premature stages of the pandemic. Certainly, in spite of the start of pandemic, near the beginning IMV used to be considered as a better option for CARDS as in the pneumonia associated with COVID-19[16] and distinctive ARDS respiratory mechanics with the features as it abridged lung conformity (i.e., ability to stretch as well as expand lungs) cannot be established. In contrast, in CARDS, good pulmonary conformity can be established therefore, it is considered that CARDS can be treated well with IMV.

The patients having the oxygen saturation (SpO2) as less than 93-94 percent or having the respiratory rate greater than 28-30 per minute and those Facing dyspnoea (difficult breathing) they must give oxygen by 40 percent Venturi mask. Following the 5- 10 minutes re-evaluation, stipulation the clinical along with instrumental depiction has enhanced, then the patient may continue the management as well as May undergoes the reassessment during 6 hours. If the treatment shows no progress, or else new aggravation, the patient then undergoes the treatment which is non-invasive, in case it is not contraindicated.

The non-invasive ventilation (NIV) as well as high flow nasal oxygen therapy (HFNO), according to the experts' board, they consider that these are performed through the systems through high-quality border fitting that do not generate prevalent dispersal of the air that is exhaled, furthermore, its exploit can be considered at the squat peril of airborne spread.

Since the process has a bigger hazard of the aerosolization, it ought to be used in those of the rooms having negative pressure. It is indicated when it is quite hard to maintain the oxygen saturation (SpO2) >92 percent or there is no improvement in dyspnoea via the standard oxygen therapy [17].The setting of the procedure is as that 30 to 40 litter per minute and when the fraction of inhaled oxygen (FiO2) is about 50 to 60 percent then it is regulated according to the clinical response. The patient may be switched to the non-invasive ventilation (NIV) if there is no improvement in the symptom following one hour with the oxygen flow > 50 liter per minute with the fraction of inhaled air as (FiO2) > 70 percent. The HFNO can also be used as for the continuous positive air pressure (CPAP) breaks or in the critical patients. The procedure is contraindicated in the patients as those having hypercapnia (high level of carbon dioxide in blood).

This process is acting as it has a key role in the management of the COVID-19 related respiratory failure. It is done as the helmet is considered to reduce the hazards of aerosolization during the procedure Grasselli et al [18]. The process of NIV as if it is to be done with the face mask the use of the expiratory valve is incorporated as well as the tubes through the exhalation port, furthermore, it then put an antimicrobial strain as on expiratory valve is suggested. The process of CPAP starts with those of 8 to 10 cm of water along with FiO2 as 60 percent. It is obligatory to not to craft numerous alterations in first 24 hours and following at least 4to6 hours if the patient is stable remove it as for about one hour and permit to take small quantity of fluids but it must be continued during night.

Protective mechanical ventilation and Intubation:

Particular safety measures are obligatory all through the process of intubation. This process ought to be done by the professional operator who must use the (PPE) personal protective equipment like N95 mask or FFP3, defensive goggles, disposable double socks, and disposable gown along with gloves. If feasible, (RSI) rapid sequence intubation must be done. In this the Preoxygenation as giving 100 percent oxygen for about 5 minutes ought to be done through (CPAP) continuous positive airway pressure process. HME (Heat and moisture exchanger) have to be placed connecting the mask with circuit of fan or else may be flanked by the mask with the ventilation balloon. The process of Mechanical ventilation ought to be done with the lesser tidal volumes as 4- 6 ml/kg PBW (predicted body weight) as well as lesser inspiration pressures, attainment of the Pplat (plateau pressure) < 28 - 30 cm H_2O[19]. Positive end expiratory pressure (PEEP) has to be elevated as achievable to sustain the driving pressure as squat as feasible (< 14 cmH_2O). Furthermore,

disconnections as of the ventilator have to be prohibited for avoiding the loss of PEEP as well as atelectasis, In conclusion, the exploit of the paralytics is not suggested except if PaO2/FiO2 < 150 mmHg. The flat ventilation as for about > 12 hours per day, along with use of the traditional management of fluid approach in support of ARDS patients devoid of tissue hypoperfusion must be emphasized [20]

Medications:

There is no proper medicines available for COVID-19 treatment but the medicines given to the patient is just to treat the symptoms or these are given symptomatically also no vaccine is still present to avoid its spread or to provide immunity to those who don't have this infection[21].

Even though no any antiviral specific treatments have been accepted, numerous approaches have been anticipated like lopinavir/ritonavir as given 400/100 mg orally after every 12 hours. Nonetheless, a current randomized, restricted trial as open-label has verified that there is no advantage through treatment with lopinavir/ritonavir when compared with the ordinary care. Preclinical studies have recommended that the treatment with remdesivir (GS5734) acting as an inhibitor of the RNA polymerase by means of an in vitro action adjacent to the several RNA viruses, counting Ebola might be effectual in favor of both prophylaxis as well as therapy of HCoVs (human coronaviruses) infections. It was used in MERS-COV infection and alpha-interferons were also used. The drugs as from anti-malarial class and those also used in rheumatoid arthritis and systemic lupus erythmatosus (SLE) by decreasing the activity as of the immune system as 500mg of Chloroquine given after every 12 hours, along with 200mg of hydroxychloroquine which is given after every 12 hours were anticipated as having immunomodulatory role in therapy. Noteworthy, in a trial that was non-randomized revealed that the use of hydroxychloroquine was considerably related with the reduction in the viral load in anticipation of viral desertion; furthermore, this result was improved by the use of the antibiotics as macrolides (e.g. azithromycin). Current data shows that HCQ is not effective for either prevention or treatment of COVID-19 but it cause more side effects.Both In vitro as well as in vivo trials, certainly, have revealed that macrolides antibiotic may possibly alleviate inflammation as well as amend the immune system of the individual. Specifically, these drugs possibly will stimulate the decrease in the molecules as require for adhesion to the cell surface, plummeting the production of the proinflammatory cytokines, invigorating the process of phagocytosis through alveolar macrophages, as well as prohibiting the activation as well as recruitment of the neutrophils. Nevertheless, supplementary studies are required in favor of prescribing as well as recommending the exploit of azithromycin, unaccompanied or else coupled with supplementary drugs like hydroxychloroquine, exterior of any antibacterial groups. All over again, consideration ought to be remunerated by means of the associated use of the hydroxychloroquine along with azithromycin as alliance is able to escort to an elevated peril of the prolongation of the QT interval as well as arrhythmias. The use of Chloroquine can also encourage the prolongation of the QT interval. For the reason that the patients of COVID-19 encompass an elevated prevalence of the venous thromboembolism along with anticoagulant therapy is linked through abridged ICU related death, it is recommended to the patients ought to be given the thromboprophylaxis therapy as well[22]. Furthermore, in the case of identified thrombosis or thrombophilia, anticoagulation therapy as enoxaparin 1 mg/kg BD (twice daily) is recommended.

Another drug from the steroid group of drugs e.g. Dexamethasone which is an artificial corticosteroid accepted by the FDA (Food and Drug Administration) as an immunosuppressor which is broad-spectrum in nature as well as it is almost 30 times as active as well as having the duration of action which is 2-3 days is also longer compared to cortisone. This drug would perimeter the assembly as well as detrimental consequences of the cytokines; although, it will also restrain the defensive role of T cells along with obstruct the B cells as of producing the antibodies, potentially it would lead to the amplified plasma load of virus that will endure

subsequent to the survival of the patient from SARS. Furthermore, dexamethasone would also obstruct the macrophages from reimbursement secondary, hospital acquired infections. Consequently, dexamethasone may be helpful in favor of the use of the drug for shorter duration in rigorous and intubated patients of the COVID-19, however, it might be absolute treacherous throughout resurgence as the virus will not only endure, although, the body will be prohibited as of producing defensive antibodies. As a substitute, a pulse of the intravenous (IV) dexamethasone possibly will be followed by giving the triamcinolone which is nebulized which is 6 times as vigorous as cortisone to contemplate in the lungs merely[23]. The corticosteroids might be recommended mutually with the natural flavonoid (luteolin) since it has antiviral as well as anti-inflammatory effects, particularly its aptitude to restrain mast cells, which are the major cause of the cytokines present in the lungs.

Another drug is use for the patients infected with COVID-19 and those who were in severe condition as Tocilizumab (monoclonal antibody and IL-6 blocker). A great number of the T lymphocytes as well as mononuclear type's macrophages are stimulated, and produce the cytokines for instance IL-6 (interleukin-6) which attach to receptor of IL-6 on target cells, and cause storm of cytokine as well as stern inflammatory reactions in lungs as well as the supplementary tissues along with the organs. Tocilizumab, is (recombinant humanized anti-human IL-6 receptor monoclonal antibody), can attach to the IL-6 receptor by means of elevated affinity, consequently, and it will prevent the IL-6 itself as from fastening to its own receptors, depiction as it is unable of the immune harm to the target cells, as well as reducing the inflammatory reactions.

A further study exposed that the drug as ivermectin has shown its effectiveness in COVID-19 patients and it is an anti-parasitic which have broad spectrum drug. Ivermectin is FDA standard drug, recognized to encompass the broad-spectrum antiviral action against many viruses in the in vitro circumstances. Current investigation on the ivermectin in opposition to the SARS-CoV-2 in those as in vitro trials exposed that it can restrain the replication of the virus. The distinct treatment with this drug was proficient to lessen the virus replication as up to the 5000-fold in the culture in 48h. Conversely, there is no supplementary diminution was appeared as with auxiliary add to the time period[24] as when increased up to 72h. Furthermore, there is no toxicity of the drug with the use for either 48 or 72 hours. the Mechanism through which ivermectin showed response in opposition to the CoV-19 virus is not recognized as well as it was supposed to be functioning likewise as it shows effect on other types of viruses. It was recognized to restrain the nuclear importation of the viral as well as the host proteins. The Integrase protein as of the viruses along with the IMP (importin) α/β1 heterodimer was accountable for those as nuclear import (IN) which additionally promote the infection. Because the majority of the RNA types of viruses are reliant on the IMPα/β1 throughout the infection, Ivermectin show effect on it along with inhibition of the importation by means of the amplified antiviral effect.

Table-I: Drugs used in Covid-19 infection.

Sr. No.	Drugs	Class of drug	Action	Tested
1	Azithromycin	Antibiotic	Act on the 50s ribosomal subunit of bacteria and inhibit protein synthesis	Yes
2	Chloroquine	Anti- malarial	Heme polymerase inhibitor	Yes
3	Tocilizumab	Anti-inflammatory	It has action of inhibition of the binding of ligand to the IL-6 receptor	Yes
4	Kaletra (ritinavir+lopinavir)	Anti-HIV	Protease inhibitor	Yes
5	Ivermectin	Antihelmintics	Cl- influx and hyperpolarization leads to muscle paralysis	Yes
6	Dexamethasone	Steroids	Immunosuppressive effect especially where there is cytokine storm like infections as COVID-19	Yes

Convalescent plasma therapy:

The plasma which is taken from the recovered patients to use the antibodies present in it for those as seriously ill patients is known to be Convalescent plasma or the immunoglobulins. Furthermore, numerous investigations appeared as the subordinate transience as well as shorter hospital stay as in those patients given the convalescent plasma other than those that were not given as with the convalescent plasma. One probable clarification in favor of the effectiveness of the convalescent plasma therapy is as that the antibodies as from the convalescent plasma may repress the viraemia. An in vivo study has also shown that the effects of the antibodies produced by this process were not merely restricted to the liberated clearance of the virus as well as they act by jamming the novel infections, although, it also incorporated with the hastening in the clearance of infected cell. The Viraemia as peaks in the 1st week of the occurring of infection in the majority of the viral illnesses. The patient generally produces the prime immune rejoinder by 10–14 days, which is then subsequent to the virus removal. Consequently, hypothetically, it ought to be additionally effectual to the administration of the convalescent plasma at the early phase of the disease. Nevertheless, additional treatments may have a consequence as on the association between the convalescent plasma as well as the antibody level, counting as antiviral drugs, intravenous immunoglobulin as well as steroids.

Prevention strategies:

The measures as those required for the Prevention are the contemporary approach to frontier the extent of the cases. The Preventive measures are paying attention on the seclusion of the patients as well as vigilant control of the infection, together with the suitable actions that are adopted for the duration of the diagnosis as well as the stipulation of the clinical concern to a tainted patient. For example, the contact with the droplet, along with the airborne safety measures ought to be adopted throughout the sample assortment, as well as the sputum introduction ought to be prohibited. The recommendations as from the authorized organizations are issued regarding the preventive measures, as to evade from get in touch with the individuals as those torment with the acute respiratory tract infections Lau H et al [25]. It also includes as washing your hands recurrently, particularly subsequent to getting

in touch with the tainted people or else their surroundings. It also includes as avoiding the undefended contact to the wild animals or else farm.

The people having symptoms as of the acute airway disease ought to be reserve from gathering, and wrap coughs or else sneezes by means of the throwaway tissues, clothes, moreover, clean their hands. Fortify, especially, in the emergency departments, the appliance of austere sanitation trials which are intended for the deterrence as well as to limit the infections.

The persons having weak immune response (immunocompromised) ought to keep away from communal gatherings .The most of the significant approach intended for the people to embark on is to repeatedly clean their hands as well as the exploit the handy sanitizer in addition to evade contact as with their mouth as well as face subsequent to having interaction with a probably tainted surroundings .The Healthcare personnel who are caring for tainted persons must exploit contact as well as airborne defense to embrace the PPE (personal protective equipment) like FFP3 or N95 masks, protection of eyes with goggles, gowns, along with the gloves to avert the transmission. In the meantime, scientific study is mounting to produce the vaccine of COVID-19.

Future directions:

The extensive actions to lessen the person-to-person spread of the COVID-19 are requisite to manage the existing outburst. Exceptional consideration as well as efforts to shield and decrease transmission ought to be applied in vulnerable people as children, aged people as well as health care workers. The untimely mortality cases as of COVID-19 outburst occurred mainly in aged people, probably due to the frail immune system that allows the quicker development of the viral infection. The changes in the COVID-19 illness ought to be monitored as taking into consideration as the impending routes of spread as well as subclinical types of infections, adding together to the adaptation, development, as well as the spread of the virus amongst humans as well as probable transitional animals along with reservoirs. So, there is need to develop the vaccine as soon as possible to eliminate this pandemic and to protect the rest of the world from this infectious disease.

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