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RESEARCH ARTICLE

DIAGNOSIS OF MANAGEMENT OF SARS CoV 2 PATIENTS AND ITS CAUSE IN COVID HOSPITAL AS IPD ADMITTED IN GENERAL WARD OR INTENSIVE CARE UNIT

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ABSTRACT

SARS-CoV-2 is the causative agent of COVID -19 that is declared a global pandemic by the WHO in 2020. COVID-19 is transmitted by aerosol particle and close contact through the sneezing and coughing. Till date no effective treatment is present for its management. This review is from different article for usefull therapeutic for COVID -19. **Aim of Study;** Infection of COVID -19 to the patients and its management in hospital in general ward and intensive care unit. **Methods:** A systematic review was developed on based of screening of different research article, review article, Guidline and case profile that all are selected from electronic media from Google and Pub med. After full screening and review from article after downloading from Google the some therapeutic agents are decided for management of COVID-19 infected patient. **Result:** The initial manuscripts identified about 16 are included in this review. This study have clinical trial case report, retrospective study, prospective study and observational study. The most commonly reported medicine in this systematic review was HCQ, CQ, Azitromycine, immunoglobulin and convulsence plasma and ivermectin and doxycycline. **Conclusion:** This study has considered many study and concluded as HCQ and Azitromycine is having tendency to become patient negative for COVID -19 and there is Convulsence plasma and Immunoglobulin is usefull in severely COVID -19 infected patient.

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INTRODUCTION

COVID 19 infection was started from CHINA (WUHAN CITY). The case had been report in december 8, 2019, and many patients worked at or live around the local Huanan Seafood whole sale Market and all country of world is affected by this. COVID 19. This is positive single stranded RNA virus. it enter in body through aerosol and air particle which come from the infected patient through sneezing and cougahing. Due to remaining active at the surface where it fell down, a very long duration and have preserved its infectivity. During coughing and sneezing aerosol can spread to one meter of distance and contact of surface at which virus fell down. so there is only way to prevent the spread of virus is remain isolated because there is no any definite treatment is available till now. The Corona virus COVID -19 is affecting 212 countries and territories around the world. In world Corona virus infected cases are 3318739 and death due to corona 234264 and recovered case are 1048508.

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In India corona virus cases 35043 and death 1154, recovered cases are 9068. Severe acute respiratory syndrome corona virus, SARS-CoV -2 is the cause of the corona virus disease, this name of COVID -19 is given by WHO and this pathogens is renamed as revere acute respiratory syndrome corona virus 2(SARS-CoV-2)WHO also declared a global pandemic in 2020. SARS-CoV -2 IS A member of the family corona viridae and order Nidovrae. the family have two subfamily, coronavirinae and Torovirinae. The member of subfamily coronavirinae are subdivided into four genera which are as below.

A – Alpha corona virus - It contained the human corona virus (HCoV)-229 E and HCoV-NL63:

B-Beta corona virus include HCoV-OC43, Sever Acute Respiratory Syndrome human corona virus (SARS-HCoV), HCoV-HKU1 and Middle eastern respiratory syndrome corona virus (MERS –CoV)

C –Gamma corona virus; It include viruse of Whale AND Birds.

D – Delta corona virus; It contains viruses of Pig and Bird.

SARS-CoV -2 is the an Enveloped and positive – sense single stranded RNA virus (+ssRNA). Phylogenetically analysis of the SARS-Cov-2 genome indicates that the virus is closely related with 88% identity to two bat derived SARS –like corona viruses collected in 2018 in eastern china 9bat- SL- CoVZC45 AND bat –SL –CoVZXC210 and genetically distinct from SARS-CoVA(79% Similarity) and MERS-CoV. Genome sequences of SARS –CoV-2, RaTG13 and SARS-CoV, A further study found that the virus is more related to Bat CoV Rat G13, a bat corona virus that was previously detected in *Rhinolophus affinis* from Yunnan Province with 96.2% over all genome sequence identity. COVID -19 IS the disease have tendency to occur person to person transmission in close contact mainly via respiratory droplets, produced when an infected patient coughing and sneezing. Fomite may be a large source of transmission. Infection can be transmitted through droplets of different size, when the droplet particles are 5-10 micrometers in diameter, that are referred as respiratory droplets and when the size are < 5 micrometers in diameter they are referred to as droplets nuclei, Transmission may also occurred through fomites in the immediate environment around the infected person. Therefore transmission of COVID -19 virus can occur by direct contact with infected people and indirect contact with surface in the immediate environment or with object used on the infected person. In COVID -19 air born transmission may be possible in special condition and setting in which procedure or support treatment that generate aerosol are performed i.e Endotracheal, Intubation, Bronchoscopy, Open Suctioning and Nebulization etc. There is no faeco oral transmission except one study. The virus remain alive a very large duration on the surface on which it shed so for prevention it should be clean frequently with sodium hypochlorite solution.

There is virus can live on very large time on the surface of different material as on steel it remain alive for 3 hour and on cardboard about 24 hour.

Screening of suspected patients

- All symptomatic (ILI) individuals who undertaken international travel in the last 14 days
- All symptomatic (ILI) contact of laboratory confirmed cases.
- All symptomatic (ILI) healthcare personal.
- All hospitalized patients with severe acute respiratory illness (SARI) (fever, cough and shortness of breath)
- Asymptomatic direct and high risk contact is of a confirmed case should be tested once between day 5 and day 10 after contact.
- All symptomatic contact of laboratory confirmed cases.
- All symptomatic ILI within hotspot/containment zones.
- All symptomatic ILI among returnees and migrants within 7 days of illness.
- No emergency procedure (Including deliveries) should be delayed for lack of test however, sample can be sent for testing if indicated as above (1-8) simultaneously.
- ILI case is defined as with respiratory infection with fever. 38 and cough.

SARI case is defined as one with acute respiratory infection with fever. 38 and cough and requiring hospitalization.

Diagnosis of suspected cases can be done by as a - rt pcr

- Nasopharyngeal swab and Oropharyngeal swab and also Nasal swab and throat swab.
- Bronchoalveolar lavage, Tracheal aspirate and Sputum
- Faecal matter,
- Blood

ANTIBODY AS IGM and IGG.

ANTIGENS OF COVID -19

In the infection of COVID -19 in the patients the first appear the antigen from first day and can be traced by RT-PCR from different site of body as throat swab, nasal swab and nasopharyngeal swab. Antibody is form in the body after some time of patient recovery as IgM is form at 7 th day of infection and IgG IS FORM ABOUT 14th day of infection. Both antibody is checked by lateral flow method by the blood. ELISA is a common biochemical technique that can detect both antigen and antibody. This figure shows that sequential appearance of antigen and antibody on basis of duration; antigen is appear very early and antibody in which igm is appear at 7 th day and igg is appear at 14 th day. This also depict the stage of infection in the patients.

Patients Of Covid – 19 Infected Patient Can Be Presented As

- Uncomplicated illness- having fever cough and sore throat nasal congestion, malaise and headache or patient may be complete asymptomatic.
- Mild pneumonia -having cough with breathlessness and fast breathing
- Severe pneumonia – having fever cough breathlessness and respiratory difficulty, rate of respiration is. 30, and spo2 is < 90% on room air
- ARDS - Onset new or worsening respiratory symptoms within one week of known clinical insult. Chest imaging show bilateral opacity not fully explained by effusion, lobar or lung collapse.

ARDS is 3 type as

A mild ards – pao2/fio2 =200 to 300 mmhg and peep >5
 B moderate ards –pao2/fio2 =100 to 200 mmhg and peep >5
 C severe ards –pao2/fio2 =pao2/fio2 =<100 mmhg and peep > 5
 When pao2 is not available then spo2 /fio2 is taken as <315 for ards.

There are four triggered level for a clinical alert requiring clinical assessment based on the NEWS.

- **LOW SCORE (1-4)** This level of patient can be assessed by a trained nurse and should decide whether a change to frequency of clinical monitoring and requirement of clinical care.
- **MEDIUM SCORE (5-6)** At this level required urgent review by clinician with competencies in the assessment of acute illness and decided the level of critical care.
- **HIGH SCORE (7 OR more)** is key trigger threshold and should prompt emergency assessment by a clinician team and critical care competent and patient should be managed in higher dependency area.

- **A SINGLE RED SCORE (3 IN A SINGLE PARAMETER).** It is unusual but should be prompt an urgent review by a clinician with competencies in assessment of acute illness and decide the level of critical care.

Because no any effective treatment is present now so for containment of infection it is important to stop infection through self isolation and social distancing in community levele is good method for its prevention, so Government of many country is decided for lockdown and Janata -curfew. During lockdown the environmental pollution decreased and level of pollutant in environment decreased. India is 21of world most 30 polluted city. All mode of public transport such as Metro Train, buses, Interstate-Trains, domestic flights and International flights stopped. Because of above air was unhealthy as 91 micrograms per cubic meter of PM2.5 that is dropped to 71 micrograms per cubic meter. Data from the Central pollution control board of India that 71 % decreases in nitrogen dioxide level. On march 25 first day of the lockdown the average PM levels decrease by 22% and nitrogen dioxide which come from burning fossil fuels dropped by 15%.. measurements from the European Space Agency, sentinel -5 p satellite show that during late January and early February 2020, level of Nitrogen dioxide(NO2) over cities and industrial area in ASEA and EUROPE were lower than in the same period in 2019.Two week after nation wise lockdown in the UK.NO2 pollution in many cities fell as 60% but in USA and other metropolitan areas in north- eastern USA was 30% lower. Emission of green house gases in environment is also reduced.

Corona virus Induced lockdown continuously. The water quality of Ganges and Yamuna River has improved significantly in the areas with reduced industrial activities. River Ganges water quality has improved with the increase in dissolve oxygen (DO) and reduced nitrate concentration. There has been a 40%-50% improvement in quality of water in River Ganges All river in world has improved the quality of water and also become clean. In result of lockdown is good for environment. It have low environmental pollution that is very big emerging disaster in future. Society have develop more dreaded result as they feel more disturbances and feeling more depression during lockdown There are no of worker become jobless and shelter less and no of worker are forced to return own home but this indulge to live together with family. There are also domestic violence are increase. Because of above and internal and external loss of business there is loss of GDP during lockdown. There is one aspect of having decrease road traffic accident during this period.

There are no. of therapeutic agents that can be use full in treatment of COVID-19 patients such as

- CHLOROQUINE
- HYDROXICHLOROQUINE
- RAMDESVIR
- LOPINAVIR/RITONAVIR
- ARABIDOL
- FLAVIPRAVIR
- TOCILOZUMAB
- IMMUNOGLOBIN
- CORTICOSTEROID
- CONVULSANCE PLASMA
- IVERMECTIN
- DOXYCYCLINE

Immunoglobulin and convulsance plasma can be used as inhaunce immunity by providing immunoglobins. Corticosteroids are use for intubated patients or patient or ARDS.

The mechanism of action and different agent and it adverse effects and it s contraindications.

MATERIAL AND METHODS

Stematic review of the published literature was done for COVID -19 infection and treatment. The Preferred Reporting Items for Systemic Review and Meta-analysis guide line were is used for the review. Publication selected it This study included the abstracts, Original article completed and incompleated article pre proof of the accepted article, some guidelines, original research paper and research study. Google scholar were used and PubMed were is used for searching the article, The abstract and purpose of the articles found during the literature search were reviewed for COVID -19 infection and its management. Full text of of the selected article was downloaded and relavent information about the COVID -19 from all selected article was taken. The data from selected article were studied independently and selected for article. RESULT; This article consisted of 16 items downloaded from original article and screen and read properly for management of COVID -19 patients. It consider original paper, review article, case report, pre print media, pre paper and recruiting study retrospective, prospective and observational study for concluding the management.

DISCUSSION

Krishan Mohan Kapoor, and Aanandita Kapoor; Role of Chloroquine band hydroxichloroquine in treatment of COVID -19 Infection a systematic Literature 1-This study concluded that chloroquine and hydroxychloroquine is promising use in symptomatic patients with supervision. XiLiu, Huili Chen, YuqiShang, Hongqiong Zhu, Gongqi Chen, Yuanii Chen, and Shaoxuan liu etal :Efficacy of chloroquine and Lopinavir /Ritonavir in mild /general COVID -2019 : A prospective, open label, multicenter randomized controlled clinical study 2- This study concluded that the chloroquine is having role as antiviral as adhesive receptor glycosylation and making acidic autophagy. it also commented on concentrated level of chloroquin. Awadhesh Kumar Singh, Akriti Singh and Anoop Misra: Chloroquine and Hydroxichloroquine in the treatment of COVID -19 with diabetes: A systematic search and a narrative review with a special reference to INDIA and other developing countries-3 This study concluded that the chloroquine and hydroxichloroquine is low cast and good treatment therapeutic as antiviral agents. it also can be used in diabetes patients having COVID-19 infections. Sung- Han Kim, Professore, Asan Medical center: Comparison of lopinavir / Ritonavir or Hydroxichloroquine in patient with mild coronavirus disease (COVID-19), -4 study continued result awaited and there is some role of lopinavir /retonavir in management of COVID -19 mildly infected patients. Yamini Wang, MD Dinguu Zhang MD, Proff Guanhua, Proff Ronghui, Proff Jianping Zhao: Ramdesvir in adult with sever COVID -19 : A randomized, double blind, placebo- controlled, multicentric tial.

Table 1. Tabular Representation Of Remain Activeness On Different Surface

S.N.	COVID-19 ON SURFACE	DURATION OF ACTIVE
1	AEROSOL	3 HOUR
2	COPPER	4 HOUR
3	CARDBOARD	24 HOUR
4	PAPER	24 HOUR
5	PLASTIC	ABOUT 2 DAYS
6	STANLESS STEEL	ABOUT 3 DAYS
7	DOOR HANDLE	ABOUT 3 DAYS

Table 2. Tabular Representation of News Scoring Systems To Identify The Seriousness Of Patients

parameter	3	2	1	0	1	2	3
Respiration rate	<8		9-11	12-20		21-24	>25
Spo2scale 1 (%)	<91	92-93	94-95	>96			
Spo2scale 2(%)	<83	84-85	86-87	88-92	93-94 ON OXYGEN	95-96	97 ON OXYGEN
Oxygen or air		oxygen		AIR			
Systolic blood pressure	<90	91-100	101-110	111-217			>220
Pulse (per minute)	<40		41-50	51-90	91-110	111-130	>131
Consciousness				Alert			CVPU
Temp(0c)	<35		35-36	36.1-38	38.1-39	>39	

Table 4. Tabular representation of therapeutic agents used in COVID-19 treatment

Agent/dose	Mode of action	Contraindication	Drugs interaction
1.Chloroquine phosphate 500 mg every 12 to 24 hourly for 5 to 10 days	Blockade of viral entry byinhibingglycosylation of host receptors (ACE), proteolytic processing and endosomal acidification and immunomodulation	Presence of retinal and visual field change and chloroquine hypersensitivity May be used in prignency	CYP206AND CYP3A4 Substrate
2.Hydroxychloroquine 400mg every 12 hourly for one day then 200 mg12 hour for 4 day	Same mechanism as chloroquine	Hypersensitivity reaction to it and QT prolongedated patients and also retinal disease	CYP2D4, CTP3A4, CYP3A5AND CYP2C8
3.Lopinavir /Ritonavir, 400/100 mg every 12 hour upto 14 days	3CL protease inhibitor	Hypersensitivity reactions,nausea,vomiting diarrhea, hepatotoxicity cardiac conduction abn	CYP3A4 INHITORAND CYP2C8 INDUCER
4.Umifenovir,200 mg every 8 hour by mouth for 7 to 14 days	S Protein /ace 2 memberane.fusion inhibitor	Known hypersensitivity to umefenovir,hetotoxicity allergic reaction gastrointestinal upset	Metabolized by CYP3A4
5.Ramdesivir, 200 mg for 1 day and 100 mg for 5 day every 24 hour	RNA polymerase inhibitor	Elevated.transaminase and kidney injury	No CYP enzymes Reactions
6.Flavipiravir, 200mg based on indications	RNA polymerase inhibitor	Hyperuricimia, Diarrhea Hepatotoxicity	CYP2C8 and aldehyde inhibitor
7.Tocilizumab,400mg I/V or 8 mg /kg for 1- 2 dose in 8 to 12 duration interval	IL -6 inhibition –reduction in cytokine storm	Hypersensitivity Rn to tocilizumab,headach Hypertension,Neutropenia and Thrombocytopenia	CYP1A2, CYP2B6 etc may Do low substrate

Table 5. Tabular Representation of Scoring System On The Basis Of History

SL.N.	HISTORY	SCORE
1	Travel history to out of country and COVID-19 area	3
2	Contact history with COVID-19	3
3	Fever	1
4	Dry cough	1
5	Shortness of breathing	1
6	History of similar symptoms in family and friend	1
7	Health care worker with contact history	1

On the basis of abovs scoring systems the line of action is as below < 3—home quarantine or separate space quarantine
4 -8 –hospital quarantine and test for covid-19 >9 –shift to isolation ward

There is no clinical improvment is seen in sever COVID -19 infected patents. Gilead initiative simple trial, National Institute of Allergy and Infectios disease conducted a phase 2 adaptive randomized double blind placebo control trial and WHO conducted open level multicentric trial 7 All study have the positive efficacy in sever infected patient with COVID -19.

Yun Xie, Song Cao, Qingyun Li, Erzhen Chen, Hui Dong, and Wenkai Zhang etal : Effect of regular intravenous immunoglobulin therapy onprognosisof sever pneumonia in patient with COVID-19 -8: This study concluded that the initiation of IVIG as adjuvant treatment for COVID-19 pneumonia within 48 hour of admission to the ICU can reduce the use of mechanical ventilation.

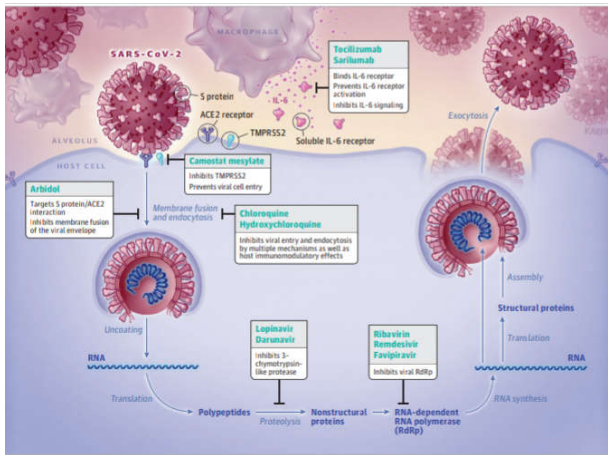


Figure 1. The Schematic Diagramme Of Mechanism Of Action Of Different Therapeutic Agent

Table 6. Tabular Representation Of Cocss Scoring

COVID-19 objective clinical severity score(COCSS)	
1. Comorbidities	
Cardiovascular diseases	1
HTN	1
DM	0.5
COPD/Asthma/Active PTB	1
Immunocompromised condition/drugs/ malignancy	0.5
Chronic kidney disease/CLD	0.5
2. Smoking	
Never smoked	0
Reformed	1
Current	2
3. Age	
<49	0
50-64	1
>65	2
4. Fever	
≤38.1	0
≥38.2	2
5. Shortness of breathe	
No	0
Yes (with hemoptysis)	4(6)
6. Systolic Blood pressure(mm hg)	
SBP>90	0
81-90	2
<80	6
7. Pulse rate(per minute)	
61-99	0
100-139	2
<40 or >140	4
8. Respiratory rate(per minute)	
<24	0
24-32	2
33-39	4
>40	7
9. Oxygen saturation at room air(%)	
>93	0
89-92	2
<88	6
10. Auscultation	
Normal auscultation	0
Minimal or focal findings	2
Diffuse wheeze/ronchi/crepts	6

Wenling Wang, Yanli Xu, Ruqin Gao, Roujian Lu, Kai Han and Guizhen Wu: Detection of SARS-cOv-2 in different type of clinical specimen; JAMA 2020march 11-9 that give the percentage of positive ness of covid-19 in different specimen in which maximum percentage is in bronchoalveolar lavage. Indian Council Of Medical Research; Revised strategy of COVID 19 Testing in India(version 3, dated 20/03/2020. This guideline for screening of patient and also taking the sample of patient.

Table 7. Tabular Representation Of Cocss Assessment Of Severity of The Patients

Score	Disease of severity	Category	Site of treatment
0-7	Mild	A	Covid-19 hospital ipd with general care
8-12	Moderate	B	Ipd with vital monitoring
>12	Severe	C	Icu

Table 8. Tabular representaion of management of covid patient on the basis of severity grade

Sl.n.	Category	Treatment
1	ASYMPTOMATIC	Sympatomatic treatment as antipyretic
2	MILD	Hydroxichloroquine +Azithromycine+antipyretic+symptomatic
3	MODERATE	Hydroxichloroquine +Azithromycine +Oseltamvir+symptomatic
4	SEVERE	Immunoglobine (IVIg)/Canvulsant plasma along with antiviral and symptomatic

James. M. Sanders, Margueurite L., Mongue, Tomasz Z.Jodlowski and James Cutell : Pharmacologic treatments for corona virus Diseases 2019(COVID-19) –A review;11 this review give idia about the different type of therapeutic agent used in COVID-19 Infection Harapan Harapan, Naoya Itoh, Amanda Yufika, Wira Winardi, SyntatKeam and Haypheng Te etal: Corona virus disease 2019 (COVID-19: A literature review : Journal of infection and public health, 13(2020)667-673.-12 This article give the evidence of effectiveness of oseltamvir and ramdesvir in severe patient of infected with COVID -19 individually. Sumaira Omer, Salamat Ali and Zaheer ud Din Babar: Preventive measure and management of COVID -19 In pregnancy : Drugs &Therapy Prospective 13-In this study there is given some idea about treatment of pregnant woman with COVID -19. Lopinavir/ Retinavir 400/100 mg with alfa interferane (5 million in 2ml of sterile water for injection) has shown the improvement in clinical condition and the breast feeding to baby is through breast pump is allow and contact is not allow.

Chenguang Shen et al. Treatment of 5 critically ill patient with COVID-19 With Convalescent plasma:-14 I n this study there convalescent plasma is given to 5 critical patients with all antiviral and supportive treatment. they all improve after giving plasma. Kamal kant kohli Medical dialogues; doxycycline and ivermectin combomay be new effectiveCOVID-19 treatment; DR MD TAREK ALAM the Head of Medicine Department at private Bangladesh medical college, use the antiprotozoal Ivermectin and antibiotic Doxycycline give miraculous result in curing the patient with covid -19 patient. Clinical trial. gov;Hydroxichloroquine, osaltamvir and azithromycine for the treatment of COVID -19 infection: An RCT (protect) -16 result is not declared but there is good roll in management of COVID-19 patient positive patients become negative on this therapy.

Conclusion

The all considered the studies concluded that patient first screened for test of COVID -19.The criteria of screening on the basis of history of patients as The above suspected patient should be tested through RT PCR from different specimen such as nasopharangeal swab, throat swab, oropharangeal swab, BAL, tracheal wash and other. Mostly throat swab and nasopharangeal swab is taken. If upper respiratory specimen is

negative and patient is clinical symptomatic then lower respiratory specimen should be taken and send for examination. When the report is found positive for COVID-19 patient should be shifted to COVID -19 dedicated hospital and severity is decided. If patients is not become negative after full course as above patient can be treated with Ivermectin 600 mg BD and Doxycycline 100 mg bd for 3 day and repeat the specimen.

Limitations

This systematic review had limitation including a small sample size of publications and limited data regarding the study.

Declaration of competing interest: N/A

Funding: No funding received

Ethical Approval: Not needed

Abbreviation: CQ–Chloroquine, HCQ-Hydroxychloroquine, SARS –CoV -2 Severe acute respiratory syndrome,

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