



TO VIEW THE BACKGROUND STUDY, PATHOLOGICAL ASPECT AND MANAGEMENT OF COVID-19

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ABSTRACT On this study we are going to view the all pathological aspect of the COVID-19 in its background origin. This virus can be easily transmitted from one person to another person contact by air, droplets mode etc. it causes severe respiratory distress with major complication like pneumonia, emphysema and other systemic illness. This virus attack to cellular structure in our body, where it producing migration of the cytokines, inflammatory cells to induces the organ damage mechanism in our body. This produces verities of the systemic illness, dysfunction, pathogenesis lead to fatal condition in human beings. There are various pathological investigations for identify of this virus in our body. Therefore, there are many safety measurements, precautions are taken by the World health organisation as an international emergency towards the prevention of COVID-19.

KEYWORDS : COVID-19, Diagnosis, Pneumonical Picture, Pneumonia, Pathogen, Viral Infection, transmission, pneumonia, emphysema, ACE2, Alveolar Epithelial Cells, Cytokines.opacity, pleural effusion, emphysema, nucleic acid test, throat swab, glass ground opacity, immunity, infection, predisposition, severity, multiplication, dysfunction

INTRODUCTION

This is a COVID-19 infection is also known as a 2019 Novel coronavirus (2019-nCoV) Which has been rapidly increased, spread in the china and throughout the whole world, countries to producing a pandemic situation. There are many and first case of this viral infection was reported in the Wuhan, china. Where it is originated. This is one of the deadly viral infection which affect through the commonest mode of their transmission from the person to person contact. Which are basically asymptomatic in their early stage of life. This virus can rapidly transmit from person to person contact and affected a large number of people. There are various reservoir of their mode of transmission such as plastic, stainless steel, cotton etc. when it enters in the body through the nasal passage then it enters into the carious lobes of a lung, where it develops colonies and rapidly multiply to transmitted through other vital organs of our body. It causes sever acute respiratory distree syndrome through which most of the patient were die. This virus causes various pathological complication develop in our systemic ground which leads to fatal condition. this may be transmitted br three types of a carrier such as symptomatic carrier who develop symptoms of the virus infection like fever, throat complaints etc. Asymptomatic carrier who did not shown any symptoms of this virus but still virus exist in their body, on other hand the pre symptomatic carrier before the stage of symptomatic one. so, there are many varieties of this virus infection seen in the human beings with the various stages and complications developed. This is no such specific medicine and mode of treatment for the management purpose of prevention of virus because when it enters in the body so it produces various complication by combining with an angiotensin converting enzyme and causes cardiac pathology, pulmonary complications. So, it treated according to the symptomatology. Because every individual having different susceptibility, immune response so the pattern of disease symptoms may vary according to person to person.

Epidemic outbreak in china- (COVID-19)

The Chinese centre for the disease control and prevention was recently published the number of large case series to the viral infection (COVID-19) in china.

There are 72314, updated to February 11, 2020). Among these 72314 cases recorded (6% cases diagnosis based on the positive nucleic acid test which result from the throat swab samples). On the other hand, the (16,186) were suspected cases were recorded as (22% diagnosis based on the symptoms and exposure only). 10567 as clinically diagnosed where, (15 % the diagnosis is being used in

the Hubei province only), there is no such test were performed but the diagnosis was made in the ground of the symptoms exposure, and presence of the lung imaging features with the pneumonia picture of the disease condition as coronavirus pneumonia.

Where 889 as asymptomatic cases (1 % diagnosis by the positive viral nucleic acid test result but the lacking typical symptoms with the fever, dry cough, fatigue) etc.

Most of the age group were affected in between the 30 to 79 years of (87 %), 1 % were 9 year or younger, 1 % is 10 to 19 year, 3 % were 86-year-old, most were diagnosed with positive Hubei province (75 %),

COVID-19 gets rapidly increased from single city to entire country in within 30 days. The number of infections was seen in the Wuhan, Hubei province.

Which reflect the typical outburst of a epidemic spread of this viral disease.

From the first early cases suggested of a common source, with the zoonotic spill over at Huanan seafood wholesale market, and the later cases were suggestive of a propagation of this virus to be person to person transmission. In 2003, the Chinese government has improved the epidemic responses capacity. But some cases are evident to response to COVID-19. There was SARS outbreak, 300 cases were reported, 5 death already in china report to WHO, whereas in COVID-19 outbreak cases were 27 and zero death was noticed By WHO (January 3, 2020) according to the notification of WHO, 2 months elapsed before this SARS-Cov identified compare to the 1 week from the notification to the 2019-COVID-19 identified.^[1]

On February there are 79394, confirmed cases and 2638 death were recorded from COVID-19 in mainland china, where 48557 cases and 2169 death recorded in Wuhan, china.^[11]

Origin of COVID-19

- At 8th December- onset of the symptoms in first case of pneumonia with number of causes in the Wuhan city, Hubei, china.
- At 31st December- report at WHO the china reports a cluster of cases of pneumonia with the number of cases in Wuhan. There are 27 cases with no deaths.

- At 7th January- Chinese scientist identify a pathogen caused as novel coronavirus.
- At 30th January- WHO globally alert this viral infection and declared as on the emergency in international level. China 7736 confirmed cases with 170 deaths. Whereas, outside the china 82 confirmed cases and no death.

At 20th February- the china has 74675 confirmed cases, 2121 deaths. Outside the china there are 1073 confirmed cases reported, 8 deaths.^[2]

Pathway of Transmission Of COVID-19

Generally, this virus exists in our surrounding environment, virus can easily spread from person to person contact with the asymptomatic mode of transmission. Firstly, it affects the upper respiratory track in our body though the nasopharyngeal passage. The duration of this virus through nasopharyngeal passage is longer. This can easily spread from the droplet infection form from one individual to another one by touching their hands.

At the later stage of transmission, it leads to the lesion developed in the lobes of the both sided lungs with great opacity and consolidation.

It causes pneumonia, emphysema with the sudden acute distress in the respiratory system which causes emergency condition in the systemic ground of the human body.

When it enters in the upper respiratory track then it transfers to the alveolar sac where it combined with an ACE2 to form a complete on the wall of endothelial lining of these alveoli and enters to the various lobular part of both side lungs. In lungs they grow and develop a colorization to form a lesion in a multiple form and spread throughout whole part of the lungs. In second stage after involvement to lungs it can be transmitted to other systemic ground of the body like portal system, liver where it causing some lesions, nodular growth, gastrointestinal track, lesion develop in the mucosal lining of the intestine. And spread throughout the whole part of the body and finally leading to the multiorgan failure to fatal condition in humans.^[6]

Life Span Of COVID-19

According to the new England journal of medicine. The survival rate of this virus persists for several hours to number of days on the surface and aerosols.^[9]

Medium	Hours of survival and no. of days
Air	3 hours
Copper	4 hours
Cardboard	24 hours
Stainless steel	2-3 days
polypropylene plastic	3 days

Incubation Period

The incubation period of this virus is around 2-14 days.

Characteristics of COVID-19

This virus is widely spread in the humans and many other vertebrates and lead to the several respiratory diseases. It enters into the cell to combined with angiotensin- converting enzyme (ACE2) receptor. It predominantly effects on the lower respiratory track, and bind to the ACE on the alveolar epithelial cells. It leads to the inflammatory cytokines. These cytokines are the responsible for a organ damage. It will be leading into activation of our immune cells and inflammatory cytokines chemokines into pulmonary vascular epithelial cells.

Clinical pattern of COVID-19

As we know this viral infection is predominantly affect the upper respiratory track leading to further complications and syndrome in our human body^[4]

There are following symptoms are commonly seen

- Fever.
- Melasma
- Cough.
- Dryness of throat.
- Dyspnoea.
- Headache.

- Diarrhoea.
- Pneumonia.
- Emphysema.
- Liver dysfunction.
- Mental disorientation.
- Muscle soreness.
- Fatigue.
- General weakness.

Different common and uncommon symptoms of COVID-19

There are following common and uncommon manifestation of this virus, given below,^[9]

COMMON SYMPTOMS	UNCOMMON SYMPTOMS
Fever	Nasal congestion
Dyspnoea	Sore throat
Anorexia	headache
Cough	Haemoptysis
Fatigeness	Loss of smell and taste.
Diarrhoea	Loose cough

Pathological findings in Lungs

As we know this viral infection is mostly affected on the lungs with symptoms of general cough, dyspnoea, pneumonia etc. through the CT- scanning it was found that there was a marked opacity seen in the lungs with an glass round opacities and consolidation in the lobular part of both sided lungs due to the invasion of this corona virus infection. It is bilaterally affected in lung; more than 2 lobes were affected.

There was an axial distribution of the opacity. Pulmonary infection is more commonly seen with interlobular septal wall thickening on the both side of the lungs.

Bronchial wall thickening was mostly noted in CT- scanning. Pulmonary emphysema is more commonly seen with the pleural effusion.^[7]

Haematological findings in COVID-2019

In the blood examination there are following changes seen in the cellular events;

Such as raised level of neutrophil as a first line defensive action, raised level of lymphocytes as a secondary cell mediated in this infection, increased migration of various inflammatory indices like an LDH, CRP, IL-6 and higher level of a serum procalcitonin, increased level of ferritin in the blood. As a result, there will be the hypercoagulability in the blood and prolonged PT time hence, thrombocytopenia, Disseminated intravascular coagulation.^[16]

Investigation findings -COVID-19

There are following investigations are to be done in case of this sever viral infection which can be easily transmitted from one person to another one;

- Sputum examination.
- Nasopharyngeal swab test.
- Faeces examination.
- Blood culture.
- serological test.
- Chest radiography.
- Sera sample.

Nasopharyngeal swab

A swab sampling is collected through the nasopharyngeal passage for COVID-19 nucleic acid test shown less rate for the detection of virus as compare to the sputum sample. It may show negative in their early stage of infection from COVID-19.^[15]

CT-scan findings

This viral infection is predominantly affected the lungs with multiple lesion. There is marked multifocal nodular opacity on the both lobes of the lungs with ground glass like an opacity, lesion in the lungs. There is a great consolidation on the both sided lungs.^[5]

Sputum Examination

It is one of the commonest most of the finding of viral infection. The most common method for the diagnosis of coronavirus disease 2019 (COVID-19) is (SARS-Cov-2) RNA- in throat swab

test. Whereas, this positive test denotes towards infection of the (SRAS-Cov-2) RNA. SARS-Cov-2-RNA test of sputum sample are more sensitive than viral RNA test of throat swabs but on other hand most of the patients do not shown sputum in during Convalescent period.

On other hand the fluorescence RT-PCR 2019- nCov nucleic acid test were shown positive result, sensitivity in the sputum sample as compare to other route of nasopharyngeal, anal, blood for the sample collection.^[15]

faeces sample test

In this COVID-19 this faeces test plays an important role for the diagnostic and mode of transmission criteria, as we know these viruses is proliferated in the gastrointestinal track and then transmitted potentially through this faecal- oral route. There is a positive test shown in the sars-cov-2 real time reverse transcription-polymerase chain reaction in the affected individual, while this test shown negative result in sputum, nasopharyngeal swab test. So, this test shown sensitivity in the sample of faeces where it detects the virus.^[14]

Age and sex criteria in COVID-19

Age Group Criteria

Old age group people with more severity and mortality in the patient due to the lack of the immunity and more predisposition towards the any kinds of infection.

Sex Criteria

Men tends to be more the infections than in women. Hence, the percentage of male were higher than females in this affection.

Stages of COVID-19

There are mainly three main stages of this virus. Such as,^[9]

- **First stage-** In this stage there is a primary symptom of fever, cough, pain in throat, fatigensness, nausea, diarrhoea, vomiting, anorexia.
- **Second stage-** In this Stage there is sever infection in lungs leads to pneumonia, sever breathlessness. Therefore, patient is hospitalised immediately and giving all the necessary medicinal support to the patient.
- **Third stage-** there is a sudden acute respiratory distree syndrome, which lead to sudden requirement of ICU Support, immunity became down, weak.

Complications of COVID-19

This viral infection producing major and acute severity in the systemic ground of our body by rapid multiplication in their cellular events and metabolic dysfunction, such as;

- Pneumonia.
- Emphysema.
- Pleural effusion.
- Acute and sudden respiratory arrest.
- Liver metabolic dysfunction.
- Kidney / renal damage.
- Cardiovascular damage.
- Myopathies.
- Thrombocytopenia.
- Disseminated intravascular coagulation.

Cardiac pathology

This COVID-19 is spread through worldwide and producing a pandemic emergency, because these virus mainly binds to the angiotensin converting enzyme where it will producing various kind of systemic inflammation by the migration of many inflammatory, chemical mediators in our body as a result there is some pathogenesis developed in the region of heart like: inflammation of the middle layer of heart called myocardium (myocarditis), myocardial infarction, heart failure, dysrhythmias, venous thromboembolism etc.^[13]

Prevention of COVID-19

a.Vaccine and treatment-

There are many methods are undergoing for the vaccination against COVID-19 but, WHO recommended it takes atleast 18 months for the availability through the various procedures and trials on it. but at present the symptomatic treatment is one of the beneficial for overcome this viral infection every individual has different pattern of symptoms are reflecting. Hence, we should treat patient according

to the symptomatology. On other hand there was a no. such antiviral drugs available for the prevention of such infection. Corticosteroids are also not given a beneficial effect in such cases with some supportive management and treatment is done like ventilation support, Extracorporeal membrane oxygenation (ECMO), (CRRT) continuous renal replacement therapy. Through which we can maintained the emergency conditions.^[10]

b. Medicinal

This hydroxychloroquine is demonstrated as anti SARS-Cov-2 activity in vitro. Therefore, this drug is used as safety profile than the chloroquine. This drug is significantly associated in the viral load and also disappeared in the COVID-19 patients.^[11]

c. General management

There should be following measurement should be taken up^[8]

- Quarantine- to stop the migration of individuals from one place to another one.
- Isolation of the infected individuals- to protect other individuals from the transmission.
- Social distancing.
- Early detection as soon as possible.
- Hospitalisation of affected individuals in separate department.
- Treatment under the observation.

d. WHO Guidelines for COVID-19

According to the world health organisation there are following guidelines are to be given.^[9]

- a. Regularly clean our hands with soap, water, alcohol-based hand rub.
- b. Maintained atleast 1 metre distance with anyone who have coughing, sneezing.
- c. Avoid to touching our sensitive part of body like eyes, nose, ear, mouth.
- d. Covering your mouth, nose with the tissue when coughing, sneezing and immediately thrown out the tissue.
- e. Stay home for the social distancing and to break the chain of this transmission of viral infection from person to person communication.
- f. Keep you self-up to date on the COVID-19 news, surrounding hot spot areas for the better prevention of this transmission of virus.
- g. If anyone have a symptom of fever, nausea, coughing, sneezing so immediately contact with the medical helpline services, contact him and cooperate these medical people positively.

e. Homoeopathic management

As we know our homoeopathic system of medicine is very huge with the application of number of potentised medicine from various sources.

In such condition of pandemic, we go through the collection of general totality of a common symptom of this infection which are commonly seen in others also. And to select a most suitable similimum for those people who cover up all these common symptoms said to be a genus epidemicus.

This is also said to be a prophylactic measurement in the curing of this disease condition.

There are following medicine is to be used as per the stage of the infection;^[9]

- **First stage-** Arsenic album-30 (as per the direction of AYUSH), belladonna, china.
- **Second stage-** Antim tartaricum, Phosphorus, Mercurius.
- **Third stage-** Carbo veg, Arsenic album, Phosphorus.

Methodology

The data is collected from the various research papers, research articles, various journals and combined it to form a generalised conclusion of given data. Databases like Google scholar were used for collecting the articles.

DISCUSSION

In these whole studies of COVID-19 we are going to understand the various aspect of background study of this viral infection from its origin in Wuhan, china and spread easily to the outside the china, worldwide and became a pandemic problem. Hence WHO declared this as an international emergency condition to protect the other

countries towards this viral infection and general protection, safety purpose. This can be reported as many respiratory troubles with pathological pattern of pneumonia, emphysema, pulmonary infection, respiratory distress, acute manifestation with high grade febrile condition in the individuals. This cannot be controlled by the use of an immunosuppressant drugs because the rate of transmission is very fast from person to person contact. In early stage of life person is generally asymptomatic but involved in a chain of transmission of disease afterwards there is development of symptoms like fever, cough, respiratory problems and other systemic dysfunction and person goes into the sepsis in their body. The pattern of clinical symptoms was common with few variations in manifestations. It cannot be controlled by the use of indicative and specific medicine. It should be managed by the symptomatic treatment of disease suffering individual.

So, this will cause more mortality and morbidity rate in the whole world wide.

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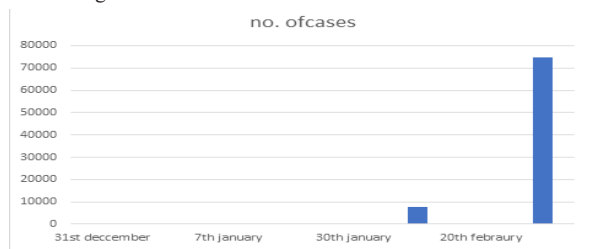


Figure.no.1.Number of cases detect in China up to February month, 2020

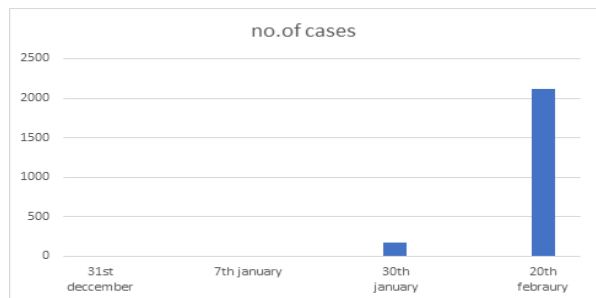


Figure.no. 2 Number Of Deaths Seen In China Up To February Month, 2020

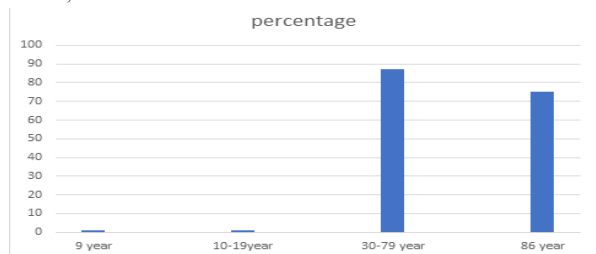


Figure.no.3. A number of cases according to age group criteria positive COVID-19 up to February 11, 2020

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