

COVID-19 UPDATE 2020 (Poster 2)

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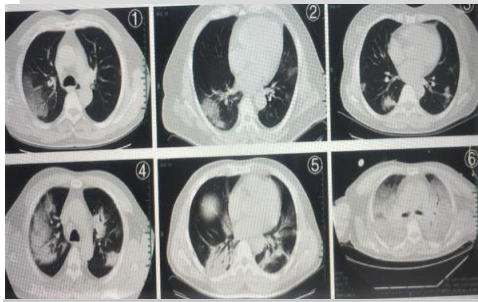
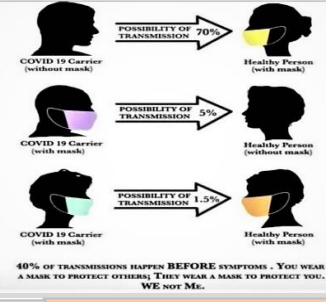


Fig: 1&2: patchy ground glass opacities:
Fig: 3 nodules and patchy exudation:
Fig: 4&5: multifocal consolidation lesions
Fig: 6 diffuse consolidation, "white lung".



If you test positive for COVID-19

TAKE STEPS TO HELP PREVENT THE SPREAD OF COVID-19

- STAY HOME:** Do not leave your home, except to get medical care. Do not visit public areas.
- SEPARATE YOURSELF FROM OTHER PEOPLE:** As much as possible, stay in a specific room and away from other people and pets in your home.
- GET REST AND STAY HYDRATED:** Take over-the-counter medicines, such as acetaminophen, to help you feel better.
- START IN TOUCH WITH YOUR DOCTOR.**

LABORATORY SAFETY

Biosafety protective level should be determined depending on different risk levels of Lab testing. Personal protection should be taken in accordance with BSL-3 for respiratory tract specimen collection, NAAT detection, and viral culture operation. For biochemical, routine tests, serological tests, BSL-2 should be adopted. Specimens should be transported in special containers (see WHO and ministry of health manuals for biosafety). Laboratory waste should be strictly autoclaved and disposed of according to WHO guidelines.

IMAGING FINDINGS

- Thoracic imaging is of great value in COVID19 diagnosis and monitoring of therapeutic efficacy.
- High resolution CT evaluation of COVID19 usually performed at the time of admission.
- Chest CT scan can be reviewed after 5-7 days.
- CT evaluation usually shows ground glass opacities in the lung peripheral, sub pleural area and both lower lobes of chest CT scan.
- Disease progression mostly occurs in the course of 7-10 days.
- After condition is relieved, the ground glass opacities can be completely absorbed.
- Critically ill patients may show further expanded consolidation.
- Patient with typical CT pulmonary manifestation should undergo continuous nucleic acid tests even if it is negative for SAR CoV-2 initially.

PATHOGENESIS OF COAGULATION ABNORMALITIES

- High incidence of coagulation abnormalities and thrombotic events reported.
- Elevation of PT, APTT, D-Dimer, thrombocytopenia. DIC in 70% non survivors.
- Presence of lupus anticoagulant in circulation.
- Fibrin thrombi in small pulmonary arterioles causing diffuse alveolar and endothelial damage (cause of sudden respiratory failure)
- Pro inflammatory cytokine mediated pro coagulant changes mainly responsible for thrombotic tendency in severe cases.
- Increases vascular permeability, endothelial cell damage and activation mainly responsible.
- Increase recruitment of neutrophils by activated endothelial cells--- cytokine release---increased thrombosis.
- Development of disseminated intravascular coagulation (DIC) and hypercoagulability is now well established particularly in severe/critical disease.
- Coagulation studies should be performed as baseline (mainly D-dimer) and repeated subsequently
- D-dimers level may be significantly elevated in severe/critical cases → poor prognosis.

COVID-19 SITUATION IN PAKISTAN:-

First case of COVID-19 was diagnosed in Feb 2020. The first wave was largely curtailed due to good preventive/control measures. The second wave of COVID19 is rapidly spreading with alarming increase in number of cases and fatalities. Till date the COVID-19 figures are as follows:
Confirmed cases: 376926
Recovered cases: 330885
Deaths: 7696
Active cases: 46044
There is a possibility that with repeated transfer of virus from person to person the virus has mutated with more virulent activity.

SUPERSPREADERS:-

- Multiple super spreading events have been noted with COVID-19, associated with explosive growth early in an outbreak and sustained transmission in later stages.
- Super spreaders can pass the infection to large number of contacts including health workers.
- Some of these persons are also super shedders of virus.

ASYMPTOMATIC TRANSMISSION:-

- According to new CDC guidelines, most Coronavirus infection spreads by asymptomatic or pre symptomatic carriers. They are estimated to account for more than 50% transmission. Studies show that 40-45% of infected persons never develop symptoms in symptomatic person's transmission risk peaks in the days just before symptoms and for a few days thereafter coinciding with peak in transmission rate.
- The proportion of asymptomatic cases in children is significant and they may play a role in community spread.

PEDIATRIC CONSIDERATIONS:

- Relatively minor illness in smaller children may be explained by age related immune response which is not fully developed. There is also decrease in number of ACE2 receptors. Emergence of multi-system inflammatory condition similar to Kawasaki disease has been reported (thrombi-embolism and redness in fingers and toes) and toxic shock syndrome in few cases.

COVID-19 MANAGEMENT OUTLINE

Treatment outline. There is no proven or approved treatment for COVID-19. The following treatment plan is suggested on the basis of information available till date on various investigational treatment approaches.

SEVERITY OF ILLNESS	PLAN
Mild illness without any risk factors/ Co-morbidities	<ul style="list-style-type: none"> Outpatient care Strict Home Quarantine monitored by government/health authorities Supportive care Assess patient's clinical condition via telephonic conversation/ using telemedicine facility
Moderate illness	<ul style="list-style-type: none"> Dyspnea Hypoxemia Infiltrates/ consolidation on chest x-ray/ CT scan
Severe/Critical illness:	<ul style="list-style-type: none"> Mechanically ventilated patient's Multi lobar/ bilateral lung consolidation Careful using these drugs in patients with multi organ damage

Future Modalities of Treatment

- Tocilizumab (anti IL-6) to be used as a routine.
- Monoclonal antibodies
- IV Immunoglobulins
- ACE2 receptor inhibitors
- Angiotensin II receptor blockers
- NOTE: Convalescent plasma therapy was not found to be effective in most of the severe/critically ill patients.

UNUSUAL SYMPTOMS IN COVID -19 PATIENTS

- Brain fog (depression , anxiety , dementia , insomnia, lack of concentration within 90 days after recovery)
- Pathophysiological mechanisms in neurological complications includes cytokines storm damage, presence of micro thrombi in small brain vessels, viral entry into epithelia lining the blood capillaries and neuro invasion.
- GI symptoms predominating at the time of presentation
- Increasing Troponin and other cardiac markers have been correlated to inflammatory markers (CRP, Ferritin, IL-6) suggesting mainly inflammatory damage as opposed to primary myocardial injury

IMMUNIZATION/VACCINE:-

Pfizer USA has declared that vaccine is now ready to be used in COVID patients with 90% efficacy. Another pharmaceutical company Moderna USA has come up with similar claim. In Pakistan Chinese Company Kasino Bio in collaboration with NIH is successfully conducting last phase of clinical trials for the vaccine. It is expected to be available in the first quarter of 2021.

VACCINE PREPARATION

- More than 200 vaccines under research.
- Four Main mechanisms for vaccine preparation
- Killing/inactivate corona virus, then injected in people triggering immune response.
- Take spike proteins from corona virus and inject
- Take common cold virus genetically altered and give blue prints to make spike protein (Oxford University)
- RNA injected inside patients ,start making copies of spike protein (Pfizer and Moderna USA)

PREVENTION

- Wash your hands**
 - Wash your hands frequently with soap and water for at least 20 seconds
 - It is important to wash
 - Before eating or preparing food.
 - After using rest room, leaving public place ,blowing your nose ,coughing and sneezing, handling of mask ,changing a diaper ,caring for someone sick ,touching animals or pets .
 - Hand sanitizer can be used that contains 60% alcohol
 - Avoid touching your eyes.
- Avoid close contact**
 - Inside home; avoid close contact with people who are sick or at higher risk.
 - If possible maintain 6 feet distance.
 - Outside your home; maintain 6 feet distance between yourself and others
 - Asymptomatic persons may be able to spread.
- Cover mouth and nose with mask**
 - You can spread COVID-19 to others even if you don't feel sick.
 - The mask is meant to protect other people in case you are infected
 - Everyone should wear mask in public places
 - Mask should not be placed on your children less than 2 years age, those with difficulty breathing or unconscious.
 - Mask is not a substitute for social distancing, continue to keep 6 feet between yourself and others.
 - Always cover your mouth and nose with a tissue paper when you cough and sneeze or use inside of your elbow and do not spit
 - Throw used tissues in the trash
 - Immediately wash your hands after cough or sneeze.
- Clean and disinfect**
 - Clean and disinfect frequently touched surfaces daily (tables, door knobs, counter tops, handles, desks, phones, faucets, sinks etc.)
- Monitor your health daily**
 - Watch for fever, cough, shortness of breath, sore throat, body aches and pains or other symptoms.
 - Take your temperature if symptoms develop.
 - Don't take temperature within 30 minutes of exercise or after taking anti-pyretic.
 - Avoid sharing personal household items
 - Home Remedies (Mainly as anti inflammatory and immune boosters)**
 - Vitamin D (↓ Pro-inflammatory cytokines ↑ anti cytokines, anti-viral properties, immunity booster)
 - Vitamin C (anti-inflammatory ,immunity booster)
 - Zinc (anti-viral ,immunity booster)
 - B-complex
 - Pure honey, walnuts, turmeric, garlic, kalongi, high protein diet.
 - Plenty of water, Green tea, Ginger tea , Yakhni
 - Steaming.
 - Breathing exercises (Deep breathing in prone position).

FUTURE SCOPE/ Recommendations

- To establish the role of cytokine storm to device therapeutics, vaccines and supportive care modalities.
- What is the window period when patients are most infectious
- What are the determinants of health versus dysfunctional response and biomarkers to define immune correlate.
- What is the protective role of T-cell immunity and duration of both antibody and T-cell responses.
- Greater understanding is needed regarding long term consequences following acute illness and multi system inflammatory disease.
- More insight is needed to explore why some patients develop more severe illness while others don't and remain mildly symptomatic or asymptomatic particularly children.
- More studies needed to identify specific strains common in certain population and role of mutation during transmission also genetic and racial susceptibility in covid-19 infection.

REFERENCES (Poster 1 & 2)

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