

Clinico-Pathological Correlation of COVID-19 Disease with Its Impact on Socio-Economic Life

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ABSTRACT

The COVID-19 disease is ruling the world with its magnanimity. The leaders have imposed the “Lockdown”. The people are dying, suffering, inconvenienced, uneasy, restless, workless, and staying indoors. It is time we muse, think, deliberate, reconstruct all the happenings, get into a holistic view to improve our understanding, dispel confusion, become more focused, responsible, rational in making decisions and regain a life for health and happiness. Such an outcome, is it possible, practicable, affordable, and acceptable to all? Here is an attempt.

Key words: Covid-19, Pathology, Basis, Strategy

INTRODUCTION

The COVID-19 disease

Its clinical characters are known, Sudden, Spreads fast, especially in close contact, Large number of subclinical infections, Majority mild infections, Severe in a small percentage, and fatal in few persons (1-3). The disease manifesting as Fever, Cough, Sore throat, Anosmia, Body aches, Weakness, difficulty in breathing in severe cases lasting over 2-3 weeks (4). In earlier experience the “Flu” illness outbreaks, epidemics, pandemics have

occurred and lasted few months, and few years.

The Virus

This virus is also named SARS – CoV-2, belongs to the Coronavirus family, Particles of size 65-125 nm, replicators, nonliving, made of materials within the cell, widely distributed in various living forms-Bacteria, Fungus, plants, birds, and animal. Can be present on surfaces, air, is destroyed by ultraviolet rays and antiseptics. An organism on the verge of life, no life form is safe from infection by the virus.

The Pathophysiology

The virus enters the body through direct or indirect contact with the mucosa of the nose, eyes by infected droplets or fomites. The virus gets attached to the ACE enzyme binding site of upper airway epithelial cells to set up inflammation. In milder infection, innate immune response helps in recovery. In a severe case, the inflammation spreads to the lower airway, pulmonary alveolar infiltration, consolidation, exudation, alveolar damage, and excessive cytokine/chemokine storm (5-7). In some instances several other organs may also be involved.

Impact on Socio-Economic Life: The Lockdown

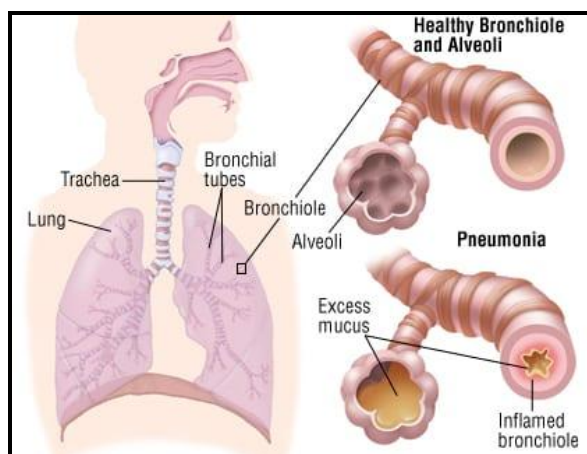


Fig.1 Showing the target organs and Pathological changes in the COVID -19 disease.

In the middle of March, 2020 leaders from several countries sensing human disaster declared an emergency order to put life to stand still, "Stay indoors till further order". They assured all the life support to their people. When we visualize "Life at Standstill", no goods, no services, no factory, no transport, no flights, no social functions, holiday, Zero Production. For a day, two or three it is OK, life goes on but two billion people in the informal economy it may sound a death sentence. These people sooner or later exhaust their savings. The school children, herded indoors, no learning,

no examinations, no play spend time watching television. The colleges are closed only online classes, virtual learning, and examination mode. The only interaction with friends and relatives is through digital phones, festivities, functions that are stalled only basic life allowed. It is uncertain when the lockdown will be relaxed.

METHODS

Observation of all the events happening around us, focused study of Pathophysiology of Covid-19 disease and tries apply logic to arrive at the Management Strategy.

RESULTS

The problem statement

Today most of the 213 countries in the world have COVID 19 disease. The world population is 7.8 Billion, the total COVID 19 cases so far 25.5 Million, 0.25 Million new cases, 16 Million recovered and deaths 0.8 Million giving a prevalence rate of 1282cases per Million, 39 per Million incidence and Death rate 1026 per Million. The stage of Infectivity, Deaths and matching prevention strategy outlined in Table I, II, and III.

Table I: Correlation of Clinical and Pathophysiological features

Pathology	Clinical Features			
	Healthy 50%	Subclinical 25%	Mild 20%	Severe 5%
Mucus Membrane Nose/Throat, Trachea/ Bronchi	Healthy			
Mucus Membrane Nose/Throat, Trachea/Bronchi, Covid virus gets fixed to ACE2 enzyme site, invasion, virus replication, Virus does not produce toxins		Virus in respiratory secretions, Infected, infective, minimal or no suffering Infective to others		
Mucus Membrane Nose/Throat, Trachea/Bronchi, Viral replication, Viral replication inside epithelial cells, inflammation, innate immune response			Virus in respiratory secretions, inflammation, irritation, mild suffering, Cough, Fever, Bodyache, Weakness, Infective to others	
Mucus Membrane Nose/Throat, Trachea/ Bronchi, Epithelial cell death, other cells infected, alveolar parenchyma, infiltration, exudation, consolidation, cytokine storm, chemokine surge, Oxygenation process affected, other organs may show dysfunction, However viral replication waning.				Besides, lung parenchyma infiltrated, consolidation, tachypnea, difficulty in breathing, hypoxia, confusion, Less infective to others

Table II. Interventions correlating with Pathological features

Pathology	Clinical Features			
	Healthy 50%	Subclinical 25%	Mild 20%	Severe 5%
Mucus Membrane Nose/Throat, Trachea/ Bronchi	Good, Healthy habits, Promote Cleanliness, Follow rules for Cough, Sneezing, Throat clearing,			
Mucus Membrane Nose/Throat, Trachea/ Bronchi , Covid virus gets fixed to ACE2 enzyme site, invasion Virus does not produce toxins		Chemoprophylaxis		
Mucus Membrane Nose/Throat, Trachea/ Bronchi, Viral replication, Viral replication inside epithelial cells, inflammation, innate immune response			Antiviral as per guidelines, Antibiotics to control secondary infections, Antiinflammatory drugs, immunomodulators	
Mucus Membrane Nose/Throat, Trachea/Bronchi ,Epithelial cell death, other cells infected, alveolar parenchyma, infiltration, exudation, consolidation, cytokine storm, chemokine surge, Oxygenation process affected, other organs may show dysfunction, However viral replication waning.				Oxygen support, antivirals, antibiotics, Plasma therapy Steroids, Nutrition supplements intensive care

Table III. Management Strategy correlating Pathological features

Pathology	Clinical Features			
	Healthy 50%	Subclinical 25%	Mild 20%	Severe 5%
Mucus Membrane Nose/Throat, Trachea/ Bronchi	Informed Person, PPEs, Mask, Hand wash, Cleanliness, Social Distance, Avoid crowd, Closed spaces, Normal activities School, Colleges, Work place			
Mucus Membrane Nose/Throat, Trachea/ Bronchi, Covid virus gets fixed to ACE2 enzyme site, invasion Virus does not produce toxins		PPEs, Mask, Hand wash, Cleanliness, Social distance, Avoid crowd, Closed spaces, Follow rules for Cough, Sneezing, Throat clearing, Nose cleaning, Stay connected with Family Doctor, Restricted Normal activities School, Colleges, Work place		
Mucus Membrane Nose/Throat, Trachea/ Bronchi, Viral replication, Viral replication inside epithelial cells, inflammation, innate immune response			Triage, Follow rules for Cough, Sneezing, Throat clearing, Stay in touch with Family Doctor, Follow doctor advice, Stay indoors, Rest in bed, Restricted activities	
Mucus Membrane Nose/Throat, Trachea/ Bronchi ,Epithelial cell death, other cells infected, alveolar parenchyma, infiltration, exudation, consolidation, cytokine storm, chemokine surge, Oxygenation process affected, other organs may show dysfunction, However viral replication waning.				Admission, Tertiary care in hospitals

The travel restrictions stay indoors strategy lead to a reduced workforce in all work places small and big, and caused many jobs to be lost also production touched zero.

The Schools have closed down, millions of learners have been affected by the closure of educational institutions, the teaching, training, assessment, examinations and

research related activities postponed indefinitely. There has been disruption in industrial activity. In view of sudden happenings, people are confused and resorted to panic buying of essential commodities. All these events have influenced every known livelihood, business establishment, including the money matters such as stock exchanges, indicating signs of economic recession.

DISCUSSION

The Covid -19 disease is certainly new but its cousin diseases like SARS, H1N1 are fairly known. The entire scenario of COVID 19 disease is centred on its rapid spread across the entire geography. A large number of subclinical cases, Milder cases, accounting to 81%, fairly quick recovery, and deaths in only 2-5% of cases are positive points. The "Track, Test and Treat" strengthened with Personal protective measures like "Sanitization, Mask and Social distancing" have been of great help so far. Just like the Cytokine storm killing the patient, Movement control order paralyzes economy. The COVID 19 scare storm, the media visuals of PPEs, Testing procedure, shifting in ambulances, Hospital scenes, Mass Burials of those dead, create terror, distaste, distrust deep wounds in the mind-set among people. A focused look at the Clinico-pathological correlations helps in making rational decisions sans emotional overtones.

CONCLUSION

A focused look at the COVID-19 disease helps in making rational decisions than harsh lockdowns.

Disclaimer

All the authors have their own contribution to the article. The study design and data collection by Dr. Sunkad, Pathophysiological features by Dr. Yagain, Intellectual content, Study overview, critical appraisal, and final clearance by Dr. Malur. Data collection, compilation, analysis, graphics, interpretation by Dr. Javali SB,

All the authors have their own personal contribution, read the article, and do not have a competing interest.

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REFERENCES

1. Abdullah JM, Wan Ismail WFN, Mohamad I, Ab Razak A, Harun A, Musa KI, Lee YY. A critical appraisal of COVID-19 in Malaysia and beyond. *Malays J Med Sci.* 2020; 27(2):1-9. <https://doi.org/10.21315/mjms2020.27.2.1>
2. Koh EBY, Pang NTP, Shoesmith WD, James S, Nor Hadi NM, Loo JL. The behavior changes in response to the COVID-19 pandemic within Malaysia. *Malays J Med Sci.* 2020; 27(2):45–50. <https://doi.org/10.21315/mjms2020.27.2.5>
3. Hamner L, Dubbel P, Capron I, et al. High SARS-CoV-2 Attack Rate Following Exposure at a Choir Practice-Skagit County, Washington, March 2020. *MMWR Morb Mortal Wkly Rep* 2020; 69:606–610. DOI: <http://dx.doi.org/10.15585/mmwr.mm6919e6>
4. David J Cennimo, Coronavirus Disease 2019 (COVID-19) Clinical Presentation, *Medscape*, Jun 08, 2020, <https://emedicine.medscape.com/article/2500114-overview>
5. Scientific Brief. WHO. Transmission of SARS-CoV-2: implications for infection ... 9TH July 2020. <https://www.who.int/news-room/commentaries/detail/transmission->

- of-sars-cov-2-implications-for-infection-prevention-precautions
6. Ch'ng ES, Tang TH. Anti-inflammatory properties of stingless bee honey may reduce the severity of pulmonary manifestations in COVID-19 infections? *Malays J Med Sci.* 2020; 27(3):150–152. <https://doi.org/10.21315/mjms2020.27.3.16>
 7. Catanzaro, M., Fagiani, F., Racchi, M. et al. Immune response in COVID-19: addressing a pharmacological challenge

by targeting pathways triggered by SARS-CoV-2. *Sig Transduct Target Ther* 5, 84 (2020). <https://doi.org/10.1038/s41392-020-0191-1>

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