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A STUDY ON COVID-19 PANDEMIC: ITS DIAGNOSIS, MANAGEMENT AND POST-COVID CONDITIONS

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Abstract:
There are important human and animal pathogens in the coronavirus family. In Wuhan, a city in the Hubei Province of China, a novel coronavirus was identified as the cause of a cluster of pneumonia cases with no known aetiology around the end of December 2019. The new coronavirus has quickly spread over the world, causing an epidemic in China, a pandemic, and a rising number of cases in many other nations. The 2019 coronavirus disease (COVID-19) is transmitted through the huge droplets coughed and sneezed by both symptomatic patients and asymptomatic people prior to the onset of their symptoms. The severe acute respiratory syndrome coronavirus type 2 (SARS-CoV-2) incubation period is thought to last for 14 days after exposure, usually four to five days. All ages may become infected with SARS-CoV-2, but the majority do so in their middle years and beyond. Many COVID-19 patients experience long-lasting symptoms such as fatigue, shortness of breath, and neurological problems such as cognitive impairment months after the first infection. A large global health burden could result from this syndrome, also known as post-acute condition of SARS-CoV-2 infections (PASC) or post-COVID-19 condition, according to recent research. Fever, a dry cough, lethargy, headache, sore throat, rhinorrhea, conjunctivitis, nausea, vomiting, and diarrhoea are among the typical clinical symptoms. As a result, there are currently no distinctive clinical characteristics that reliably distinguish COVID-19 disease from other upper/lower airway viral infections. In a small percentage of instances, COVID-19 disease may progress to pneumonia, lung failure, and mortality by the end of the first week. Although there are more research looking at the post-COVID-19 condition, there is still no agreement on how this new disease should be defined, diagnosed, and treated in clinical practise, or how the outcomes should be evaluated. For both clinical and research objectives, there is an urgent need to enhance and standardise outcome indicators for this important patient group in order to facilitate data comparability and pooling. in order to harmonise, compare, and improve the quality of data across multiple geographic areas The purpose of this article is to examine the COVID-19 disease, starting with epidemiology and moving on to clinical signs, diagnosis, and its post-COVID consequences before coming to a conclusion and discussing potential therapy options. We advocate for an international effort that involves all significant players, including medical professionals, researchers, subject matter experts, patients, and carers.
Keywords: COVID-19 Condition, Long COVID, Post-acute Condition of SARS-CoV-2 infection

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INTRODUCITON:

Healthcare systems and research networks have reacted fast to the COVID-19 coronavirus illness pandemic that has affected the entire world. There are significant human and animal pathogens in the coronavirus family. A new coronavirus was identified as the cause of a cluster of pneumonia cases with an unknown aetiology at the end of December 2019 in Wuhan, Huanan Seafood Wholesale Market, the city in China's Hubei Province that served as the preliminary site to which cases of coronavirus disease 2019 (COVID-19) were connected [1]. The novel coronavirus spread rapidly, causing an outbreak in China, a pandemic, and a rising number of cases in many other nations throughout the world [2]. The World Health Organization (WHO) declared a public health emergency after the illness spread to include more than 81.552 cases in China and rising cases (>1.400.000) worldwide since the first reporting of COVID-19. No clinical definitions or Primary Outcome Sets have been created despite the extensive data on acute symptoms and clinical care being collected and thoroughly examined (POS). With over 217 million COVID-19 cases reported worldwide [3], post-COVID-19 sickness poses a major hazard to millions of people and has to be investigated right now [4]. Despite the possibility that widespread vaccination would eventually lower the number of COVID-19 infections, the pandemic is far from ending, with cases rising all across the world. Rapid agreement on crucial Primary outcomes that must be measured is necessary in the post-COVID-19 environment. The establishment of a POS will guarantee that important findings in practise and research are regularly evaluated and published. Applying the most pertinent results consistently throughout studies and in actual practise is essential, as is comparing and aggregating research findings with translation into clinical recommendations for patient therapy. Previously known as 2019-nCoV (the new coronavirus), the virus that causes COVID-19 is now designated as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [5]. We review the data that are currently available on the post-COVID-19 condition with the primary objective of proposing and outlining the implementation of a POS for the post-COVID-19 condition I to enable the assessment of outcomes that are most pertinent and significant to stakeholders and relevant target populations, such as patients, families, clinicians, researchers, and others, in accordance with WHO's systematic approach to identifying research gaps [6]. The creation of a POS for the post-COVID-19 condition could act as a guide for the following few years until further information becomes available and/or a review or reassessment is necessary, given the urgent need for one. Our goal is to describe the epidemiology, clinical symptoms, diagnosis, and post-COVID consequences of the COVID-19 disease (SARS-CoV-2 infection) before concluding with the various therapy choices.

EPIDEMIOLOGY

Initially, a link to a seafood market in Wuhan that sold live animals and was frequented or worked at by the majority of the earlier pneumonia patients was noticed. But when the pandemic sickness expanded, person-to-person transmission took over as the main mode of infection. Large droplets released while coughing and sneezing by symptomatic patients help spread the COVID-19 infection, but it can also happen from asymptomatic people before they start to show symptoms [7]. These contaminated droplets can move 1-2 metres before landing on surfaces. Droplets typically don't hang in the air and don't reach farther than 2 metres. In ideal climatic conditions, the virus may survive on surfaces for days, but common disinfectants like hydrogen peroxide and sodium hypochlorite destroy it in less than a minute [8]. By inhaling the droplets or touching a surface that has been contaminated with them before touching the mouth, nose, or eyes, one can contract SARS-CoV-2. Even after the clinical symptoms have improved, cases may still be infectious. Additionally, some situations could function as super-spreaders. Tens of thousands of close contacts of confirmed cases in China experienced secondary COVID-19 illness attacks at a rate ranging from 1 to 5%, according to a joint WHO-China statement [9].

Clinical Characteristics, Diagnosis, and Treatment of COVID-19 Disease: The SARS-CoV-2 incubation period is thought to last for 14 days after exposure, with the majority of patients showing symptoms in four to five days [10]. All ages may become infected with SARS-CoV-2, but the majority do so in their middle years and beyond. The median age ranged from 49 to 56 years in various cohorts of hospitalised COVID-19 infection cases [11]. Fever, a dry cough, lethargy, headache, sore throat, rhinorrhea, conjunctivitis, nausea, vomiting, and diarrhoea are among the typical clinical symptoms. Therefore, COVID-19 cannot currently be reliably distinguished from other upper/lower airway viral infections by any specific clinical characteristics. By the end of the first week, COVID-19 may progress in a small percentage of cases to pneumonia, lung collapse, and death [12]. The most frequent severe COVID-19 symptom that stands out on chest imaging is pneumonia, which is characterised by fever, a dry cough, dyspnea, and bilateral infiltrates. Acute respiratory distress syndrome (ARDS) and hospitalisation all took an

average of eight days from the onset of symptoms to the onset of dyspnea. The 2nd or 3rd week marks the start of recovery. The WHO estimates that recovery takes between three and six weeks for severe COVID-19 disease and around two weeks for mild COVID-19 disease [13]. In those that were recovered, the average hospital stay was 10 days. Elderly patients get worse results and fatalities more frequently than those with co-morbid conditions (50–75% of fatalities).

Multiple Diagnoses Adenoviruses, rhinoviruses, influenza, parainfluenza, respiratory syncytial virus (RSV), human metapneumovirus, other coronaviruses, other well-known viral respiratory infections, atypical pathogens (chlamydia, mycoplasma), and bacterial microorganisms are all included in the differential diagnosis [14]. According to the China National Health Commission, COVID-19 disease is recognised based on the epidemiological background, clinical signs, and confirmed SARS-CoV-2 infection using one of the following techniques: high-throughput genome sequencing, real-time reverse transcriptase-polymerase chain reaction (RT-PCR), and serological evaluation of anti-viral immunoglobulin M (IgM) and G (IgG) antibodies [15].

TREATMENT AND MANAGEMENT:
The main types of treatment are symptomatic and supportive. Assuring adequate isolation is the first step in stopping the transmission of the condition to other contacted people, patients, and healthcare professionals. Following the doctors' instructions, suspected cases should be isolated in a single room or self-isolated at home depending on their medical conditions. In the same ward, confirmed patients may be cohorted. Patients who require intensive care should be hospitalised right away.

POST-COVID ASSOCIATED HEALTH CONDITION CONSEQUENCES
Recent editorials [16] and conferences supported by the National Institutes of Health (NIH) [17] and the World Health Organization (WHO) [18] have emphasised the importance of doing research into risk factors, clinical features, diagnosis, management, and results. There have since been more financing options [19]. It's vital to keep in mind that the majority of information on post-COVID-19 conditions was gathered prior to the introduction of the condition criteria. Therefore, earlier studies might not meet the defined defining requirements. The bulk of other human systems are impacted by the post-COVID-19 situation physically and physiologically [20]. Even though the specific origin of post-COVID-

19 syndrome is uncertain, chronic immune activation may be involved [21]. Although no risk factors for several post-acute SARS-CoV-2 syndromes have been found, multiple post-COVID-19 illness morphologies are thought to exist, though their pathogenesis, treatment, and prognosis are currently unclear. Evidence suggests that both hospitalised and non-hospitalized adults and children [22] experience prolonged symptom duration and functional limitations, even if the long-term health effects of COVID-19 are unknown. Long-term symptoms can have significant effects on overall functioning, including employment and school attendance, ranging from little discomfort to severe detrimental effects on physical, cognitive, and psychosocial health [23]. Numerous studies from many nations indicated that many individuals continued to experience symptoms six months after using COVID-19, with sleep issues, anxiety, or sadness being the most frequent side effects [24]. A recent study found that the majority of COVID-19 survivors regain their physical and functional abilities one year after acute infection. Compared to non-COVID-19 controls, some still have mobility issues, pain or discomfort, anxiety, or sadness [25]. The outcomes of the controlled investigations support earlier studies. According to a recent examination of data from over 250,000 electronic health records, more than one in three people had one or more characteristics of a post-COVID-19 syndrome between three and six months following a COVID-19 diagnosis, which was much higher than the rate for influenza [26]. The likelihood of developing postCOVID-19 issues was correlated with disease severity, female sex, and younger age. It is yet unknown if chronic symptoms and the anomalies they cause will totally go away or if some may continue to be dysfunctional for the rest of a person's life. Investigations into the post-COVID-19 state can also be challenging because of substantial loss to follow-up, the frequent use of unreliable measurement techniques, the absence of controls during the pandemic, and data censoring (for instance, for death) that is frequently underreported in published studies. Differential diagnosis may be difficult because several symptoms associated with post-COVID-19 conditions may really be signs of a more serious issue (for instance, dysautonomia in persons reporting heart rate variability) [27]. The investigation of potential treatments for problems following COVID-19 is currently in its early phases. The majority of techniques concentrate on symptom management and recovery. According to some specialists, SARS-CoV-2-specific T cells and vaccine-induced antibodies "may help the immune system in halting the virus during its initial few replications before it forms hidden reservoirs in the

body." One of the biggest obstacles to creating therapeutic strategies for post-COVID-19 disease is the absence of agreed-upon clinical trial outcomes. The psychosocial health of the general population has been significantly impacted by isolation, financial instability, job insecurity, illness or death of family members who have contracted COVID-19, stigma associated with the disease, lack of faith in governmental institutions, and ongoing media coverage of pandemic threats [28]. Changes in the way that patients with pre-existing conditions are treated have also had a significant effect. In the first quarter of 2021, care for mental, neurological, and substance use difficulties was disrupted in 45 percent of nations, according to data conducted by the WHO on the continuity of essential health services during the COVID-19 pandemic [30]. Comparatively, 57% of respondents claimed that their rehabilitation programmes continue to be disturbed (of 81 countries). Indirect effects of COVID-19 on mental health are also present, and many patients report a range of symptoms that affect daily functioning months after the acute infection, including exhaustion, shortness of breath, cognitive impairment, and lower quality of life. Considering that there are millions of COVID-19 infected individuals, even a tiny percentage developing the post-COVID-19 disease will have a detrimental effect condition.

on society and public health since numerous individuals would need ongoing management, monitoring, and care.

A recent study found that compared to the general population, COVID-19 patients who had previously been hospitalised had considerably higher rates of multiorgan dysfunction. These initiatives help create harmonised, high-quality data and provide clinicians, researchers, and policymakers with essential information on pertinent COVID19 topics. The COVID-19 POS development projects were finished fast in contrast to the traditional POS development process, which generally takes many years. Several of the COVID-19-related POS initiatives include outcomes for "rehabilitation phase," "longer term effects," and "recovery," despite the fact that none of them are totally focused on the post-COVID-19 condition [29]. Developing POS for the post-COVID-19 scenario may be challenging despite a well-established and organised approach, which is often led by the COMET Handbook, due to the diversity and multisystem nature of infection [29]. For certain populations, such as those with acute respiratory failure or acute respiratory distress syndrome, POS should be thought of as a viable substitute. Survivors following hospital discharge) who are recovering from   COVID-19
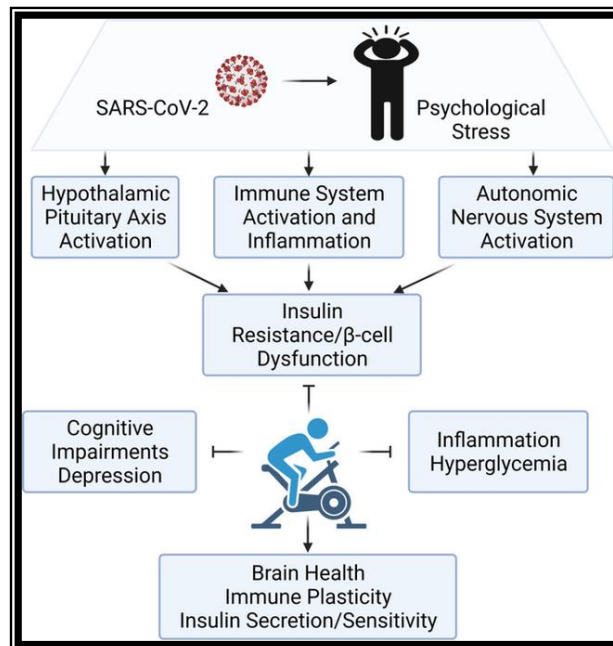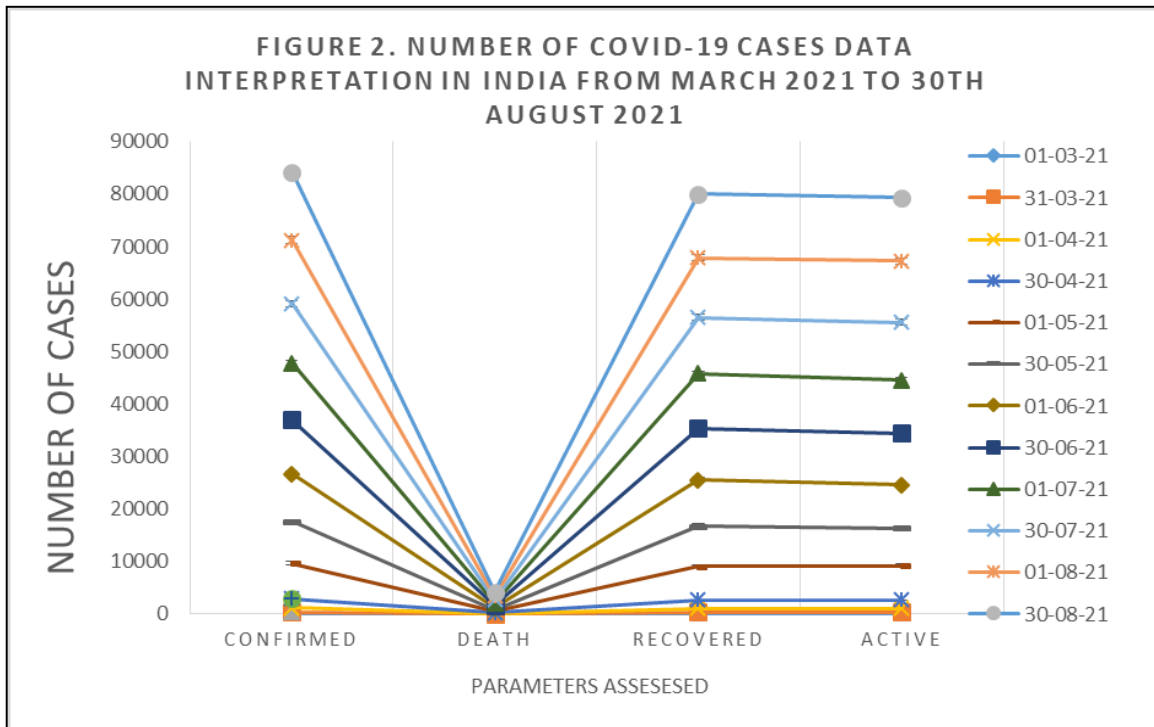

Figure 1: Representation of Various Post COVID19 Conditions of SARS-CoV-2

We analysed papers, data from clinical trial registries, and available case report forms in the living systematic review of long COVID [43], and presented outcomes previously quantified in long COVID research (Table 1).

TABLE 1: The complete list of the outcomes used in Post COVID 19 conditions

1.	Blood and lymphatic system outcomes	2.	Endocrine disorder to Diabetes mellitus
3.	Cardiac outcomes	4.	Eye outcomes Visual disturbance
5.	Ear and labyrinth variation	6.	General outcomes Fatigue
7.	Gastrointestinal, Nausea or vomiting	8.	Immune system outcomes Hyper inflammatory state-induced SARS-CoV-2
9.	Hepatobiliary measures Chronic liver disease	10.	Musculoskeletal and connective tissue outcomes Myalgia
11.	Metabolism and nutrition outcomes Unintentional weight loss	12.	Nervous system Outcome
13.	Outcomes relating to neoplasms: benign, malignant, and	14.	Psychiatric outcomes Depression Anxiety
15.	Renal and urinary outcomes	16.	Cognitive functioning Confusion
17.	Risk to self and/or others	18.	Global quality of life Reduced quality of life

Current evaluation standards for individual results call for sophisticated laboratory and imaging procedures that demand a significant time and money commitment. Such skills and resources might be limited in situations with limited resources. A diverse collection of definitions and measurement techniques that are appropriate in low- and middle-income countries should be included when building the POS. Extreme caution is needed in order to strike a balance between worldwide feasibility and evaluation accuracy. When developing a POS for the post-COVID-19 scenario, access and resource restrictions, cultural and socioeconomic differences, and other factors should all be taken into account. To guarantee that the POS is globally representative and useful in the future, clinicians, researchers, and patient advocates from LMICs should be included in the development process.

FIGURE 2. NUMBER OF COVID-19 CASES DATA INTERPRETATION IN INDIA FROM MARCH 2021 TO 30TH AUGUST 2021

DISCUSSION:

Coronavirus Disease 2019 (COVID19), a communicable disease, is brought on by the brand-new severe acute respiratory syndrome coronavirus 2 (SARSCoV2). After a reported incubation period of 1-14 days, the illness frequently presents as fever, cough, tiredness, respiratory issues, and loss of taste and smell. The majority of COVID19 sufferers, however, are asymptomatic or only experience minor symptoms, while a tiny minority experience acute respiratory distress syndrome (ARDS), which can be deadly or life-threatening. Despite the fact that the majority of COVID19 patients recover, some do not, and these people are said to have "postCOVID19 syndrome" or "long COVID," which refers to the persistence of symptoms after a COVID19 polymerase chain reaction test is negative. According to the National Institute for Health and Care Excellence, postCOVID19 syndrome is defined as "signs and symptoms that arise during or after an infection consistent with COVID19, last for more than 12 weeks (3 months), and are not explained by an other diagnosis" (NICE).

Risk factors for the postCOVID19 syndrome,

- Prevalence of the postCOVID19 syndrome,
- Interventions in patients with the postCOVID19 syndrome,
- Natural history, clinical presentation, and prognostic markers for the postCOVID19 syndrome, and
- Validated tools for postCOVID19 syndrome screening, according to NICE.

The cardiopulmonary systems appear to be the primary contributor to the bulk of post-COVID19 issues, according to the information available so far. The most frequent cardiac post-COVID19 symptoms are myocarditis, arrhythmia, and ischemia, whereas the most frequent pulmonary problems are bacterial pneumonia, pneumothorax, and pleural effusion. Systemic post-COVID19 symptoms such fatigue, headaches, aches and pains, dyspnea, and anxiety or depression are very common. Tinnitus, which is likely associated to vestibular neuritis, Guillain-Barré syndrome, encephalitis, polyneuropathy, depressive syndrome, delirium, and psychosis were all often noted as neuropsychiatric symptoms. Acute kidney damage and renal failure, as well as thrombotic issues such deep vein thrombosis and pulmonary embolism, have all been listed as potential effects. It is advised that a large number of patients be evaluated in extensive prospective cohort studies utilising standardised technique and criteria after recognising the potential long-term effects of COVID19. The impacts of other significant infectious disease outbreaks, such as SARS in 2003 and Ebola in 2004,

have already been studied using this methodology. As the acute phase of the COVIDpandemic looks to be drawing to a close, it would be useful to look at the epidemiology, clinical characteristics, and burden of any post-COVID symptoms given that similar manifestations have been recorded in individuals recovering from COVID. Not just respiratory insufficiency but also symptoms like anxiety and depression, joint and chest discomfort, headache, and dementia should be evaluated due to their detrimental effects and increased prevalence in the general population. According to earlier studies, seven patients received a customised rehabilitation intervention to aid in their recovery from COVID19 infection (30–60 minutes per day, six days per week). Postural adjustments, breathing exercises, passive upper- and lower-limb movement, passive muscle stretching, and balance and coordination drills were all incorporated in the physical activity. After leaving the rehabilitation facility, patients were evaluated for COVID19-related exhaustion, muscle strength, physical performance, dyspnea, and handicap status using standardised scales and tests. After rehabilitation, 61.2 percent of the patients reported feeling no fatigue, with the remainder patients experiencing modest levels of fatigue. Initially, 76.7 percent of the patients exhibited COVID19-related fatigue. This highlights the significance of measuring fatigue and functional condition after COVID19 recovery and creating suggestions to ensure equitable access to rehabilitation across the globe. As a result of reduced anxiety and depressive symptoms and improved physical and mental health throughout rehabilitation, a higher level of functionality. Therefore, therapy is necessary for patients who have been seriously affected by COVID19 in order to improve their functional outcomes following healing. To improve overall functional results, physical and respiratory rehabilitation must be organised and promoted at the proper time.

CONCLUSIONS:

When a person has had contact with a confirmed or suspected case and exhibits symptoms of fever and/or airway inflammation, they should primarily be considered to have COVID-19. If COVID-19 disease is suspected, infection control measures should be taken, and public health officials should be contacted. A nasopharyngeal sample should be sent for RT-PCR testing in addition to testing for other respiratory viral infections. Palliative care is essentially the only kind of management. For patients with a mild illness that can be effectively isolated, home care may be an option. Persons should be urged to wash their hands frequently, practise respiratory hygiene, stay away from crowds, and avoid close contact with sick

people in order to reduce the risk of infection spreading across society. Facemasks are rarely indicated for asymptomatic instances, although social withdrawal is suggested everywhere society has spread. Surveys of people who have first-hand knowledge of the post-COVID-19 condition were conducted by a gender-balanced international panel of experts, including members of the various Consortium. Previous studies in a variety of medical specialties have shown the value and application of POS in both clinical practise and research. Because it will enable better data quality, harmonisation, and comparability across geographical areas, a POS for the post-COVID-19 age is critically required. All relevant stakeholders, including but not limited to healthcare professionals, researchers, methodologists, patients, and caregivers, must take part in the collaborative endeavour. In order to develop POS in adults and children with illnesses connected to COVID-19, we implore local and global financial authorities to support coordinated initiatives.

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