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Covinfo-all have to know about covid

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Abstract

Coronavirus (COVID-19) is an enveloped RNA virus that's diversely found in humans and wildlife. a complete of 6 species are known to cause disease in humans. They are known to contaminate the neurological, respiratory, enteric, and hepatic systems. The past few decades have seen endemic outbreaks within the sort of Middle East respiratory syndrome coronavirus (MERS-CoV) and severe acute respiratory syndrome-related coronavirus (SARS-CoV). Yet again, we see the emergence of another eruption due to a replacement strain called the SARS-CoV-2 virus. As the number of cases continues to rise it's clear that these viruses pose a threatening effect on public health. This review will introduce a generally clear view of coronavirus and characterize the clinical features, evaluation, and treatment of infected patients. Currently, the diagnosis is acquired by the correlation between the positivity for COVID-19 genomic test and respiratory symptoms, reverse transcriptase-polymerase chain reaction (RT-PCR). Here, we abstracted the current known knowledge regarding epidemiological, pathology, clinical features, comorbidities, and treatment of COVID-19/ SARS-CoV-2 as recommendations for the control and safeguard of COVID-19.

Keywords: 2019-nCOV, SARS-CoV-2, COVID-19, Pneumonia, Anti virals, remdesivir.

Introduction

Coronavirus (CoV) could also be an outsized family of positive sense, single stranded RNA viruses that belong to the Nidovirales order. The order has Arteriviridae, Coronaviridae ,and Roniviridae families. The Coronaviridae family is further classified into Coronaviridae and torovirinae subfamilies. Coronavirinae is again sub classified into alpha, beta, gamma, and deltaCOVs [1]. Till 05/03/2020 around96,000 cases of covid disease 2019 (COVID19) and 3300 deaths are reported [2]. Epidemiology of Covid19 Clusters of COVID19, first strain was reported from Wuhan city in China, in 2019 december, have rapidly assumed a worldwide form The data reported within the present review are supported the real-time view. Corona viruses are positive stranded RNA viruses with a crown like appearance under an microscope (coronam that the Latin word for crown) because of the appearance of spike glycoproteins on the envelope. The subfamily Orthocoronavirinae of the Coronaviridae family (order Nidovirales) divided into four genera of CoVs: Alpha coronavirus (alphaCoV), Beta coronavirus (betaCoV),Delta coronavirus (deltaCOVs), and Gammacoronavirus (gammaCoV). More over the betaCoV genus classifiesinto 5 subgenera or lineages [3]. Genomic assuming has shown that in all likelyhood rodents and bats are the gene origin of alphaCoVs and betaCoVs.

On guessing , avian species appear to perform the gene sources of deltaCOVs and gammaCoVs. Members of this massive brood of viruses can motive hepatic, enteric, neurological,and respiratory diseases in several animal type, including cattle,camels, bats and cats. To date, 7 human CoVs (HCoVs) — having the ability of contaminating humans — are identified variety of HCoVs were recognized within the mid1960s, while others were only distinguish within the new millennium.In general, approximates propose that 2% of the population are healthy mediators of a CoV which these viruses are reason for regarding 5% to 10% of acute respiratory infections [4]. updates available through the WHO Situation Reports and thus the Johns Hopkins

University Centre for Systems Science and Engineering (JHU CSSE) data visualization site] until February 28, 2020. All confidence intervals (CIs) announced here are computed because the precise central CI of a proportion [5]. As of

February 28, 2020, there are 83,704 validated cases of COVID19 globally, with 2,859 death (6)Mostcases (78,824 of 83,704; 0.9416 95% CI 0.94 to 0.9433) and deaths (2,790 of 2,859; 0.9758 95% CI 0.9696 to 0.9809) are reported from China .Of the 36,654 recovered cases reported, 36,268 (0.9895 95% CI 0.9884 to 0.9905) showered from China . Outside of China , most cases were recorded in South Korea (2,337 cases), on board the italy 96550 and Diamond Princess (705). the absolute best number of deaths outside China were announced from Iran (26 deaths), and Italy (17 deaths) [6].

Clinical Presentation

SARSCoV2 causes a tract contamination with a highly variable clinical course that's enthusiastic to host and organism factors. Mild disease, observed in 81 percentage of patients within the initial Wuhan report, manifests as self-limited respiratory symptoms representative of a virus infection , which includes cough, fever, dyspnea, pharyngitis but also, interestingly, anosmia and dysgeusia [7]. Severe disease, accounting for 14% of the cases within an equivalent cohort, includes florid pneumonia whichmay reach acute respiratory distress syndrome (ARDS) in conjunction with cardiogenic or shock . **Laboratory Features**

Laboratory findings particular to COVID19 comprise increased prothrombin time, LDH (lactate dehydrogenase), Ddimer, ALT, CReactive protein (CRP), and creatine kinase(CK). within the first steps of the disease, a marked decrease in CD8 and CD4 lymphocytes can as well be noted [8]. They also displayed other abnormal findings indicative of coagulation activation, cellular immune deficiency, myocardial injury, renal injury, and hepatic injury [8]. The aged and other people with underlying disorders (i.e., hypertension, chronic obstructive pulmonary disease, ,cardiovascular disease,diabetes), developed quickly into septic shock,acute respiratory distress syndrome, and coagulation dysfunction, even leading to the death

Diagnosis

The Diagnostic testing for COVID19 is hard to find the virus, comprehension its case management, and to suppressing transmission. This document describes the strategic use of diagnostic testing in severaltransmission scenarios of the COVID19 outbreak, from zero to no of cases to community transmission, how testing as it can be improved when lack of reagents or testing capacity necessitates prioritization of certain populations or individuals for testing [9].

Polymerase chain reaction

Polymerase chain reaction (PCR) testing trusted source remains the first COVID 19 diagnosing testing method with in United states. This is often an equivalent of test that was went to detect severe acute respiratory syndrome (SARS) when it is first appeared in 2002.

To collect a sample for this test, a health care provider will likely execute one of the below mentionpoints

- Swab of the nose or the rear of the throat.
- Aspirate fluid from the lower respiratory tract.
- Take saliva or stool sample.

Researchers then extract macromolecules from the virus and amplify the viral genetic make up 0througha reverse transcription PCR (RT-PCR) technique. This gives them a bigger sample for viral comparison. Two genes are often found with in the SARS-CoV-2 genome [10].

Antigen testing

Antigen tests are immuno chemical assays that identify the presence of a specified viral antigen, which causes current viral infection. The currently permit antigen tests are not confined to make use on persons of a certain age. Antigen tests are adequately low price, and most can be utilized at the point of care. Most of the presently permited tests Antigen tests for SARS-CoV-2 are generally having low sensitive than real-time reverse transcription polymerase chain reaction (RT-PCR) and other nucleic acid amplification tests (NAATs) for detecting the existence of viral nucleic acid [11].

The rapid antigen test comes in handy only while detecting patients someone are quite symptomatic. The tests authorized for the concealing of asymptomatic individuals without known vulnerability are listed with "screening" in the attribute column; pooling, saliva,

multiple-analyte, home collection, and home testing are like wise listed. Tests that are done without a prescription contains the attribute "OTC" (for over-the-counter at-home tests) or"DTC"(for direct-to-consumer home collection tests) [12].

Sample collection and testing
COVID-19 Ag Procedural Steps

Stage 1: preparing the specimen

1. Collect the nasopharyngeal swab specimen, by inserting the aseptic swab into the nostril
2. By Using the gentle rotation, move the aseptic swab until resistance is reach at the extent of theturbinate
3. Rotate the sterile swab many times opposite to the nasopharyngeal wall & leave that sterile swab in the place for 10 sec to soak the swab end.
4. Take out the swab from the nostril carefully
5. Repeat the above mentioned procedure in the another nostril
6. Keep the swab specimen into the buffer solution in the tube. While pressing the buffer tube, stir the swab extra 10 times. This buffer inactivates the virus thereby decreasing the biosecurity&biosafety demands.
7. Take out the swab while pressing the walls of the

   tube to draw out the liquid from the swab
8. Squeeze the nozzle cap tightly onto the buffer tube.

Execute the Test (read only mode)

1. Prepare the test devices situated on the workload
2. Prepare the draw out Specimens in the buffer tubes
3. Mark the Test Cartridges as perspecimen application plan (from 1,2,3, 4…and patient ID)
4. Apply 4 drops of draw out specimen to the specimen well of the test device same as above sequenceabout 20 seconds intervals
5. Keep the test device aside for 15 minutes on a flat surface for incubation
6. Make ready F100 or F200 analyser & select the READ ONLY MODE same as per user manual 7.place the test device into the analyser which has completed incubation duration
7. choose the specimen type
8. The analyser will spontaneously scan & show

   the results in 1 minute after the specimen type selection.

execute the Test (STANDARD MODE)

1. Select Standard Test Mode & place the Test Device when prompted
2. Add 4 drops of draw out specimen to the Specimen

3. well present on the test device.
4. After adding the specimen, immediately press 'TEST START' button
5. The analyser will automatically show the result after pressing the test start button [13]

HRCT Diagnosis

High resolution computed tomography (HRCT) is not considered a testing survey of patients possessing ED with respiratory symptoms, as it contains radiation subjection, the probability of virus lay out to health care employes, medical costs, and long time required for decontamination. HRCT is recommended in patients with mild to severe symptoms to assess the severity of the damageand pulmonary dysfunction and for take of a possible false-negative outcome from a negative RT-PCR test outcome [14].

HRCT is more reactivity in identifying lesions (sensitivity range that varies between 93% and 97%) but low specificity (53% and 25%) Specificity and Sensitivity of HRCT classification system was 77.6 and 73.7 respectively.. LDH,ferritin,AST and ALT were more in Group 1 and D-dimers levels was more in Group 3; differences however were not scientifically significant [15].

HRCT was examined by three expert consultant radiologists in consensus. In patients who are initially screened asymptomatic. HRCT results importantly impacted the

clinical decision (P less than 0.0001); PCR had to be frequented with home isolation (43.3%). The main element to make identification of covid 19at HRCT is the existance of GGO(16)How HRCT Scoring the Pattern and Severity in Covid patients Three attending radiologists (two thoracic radiologists and a third non-thoracic radiologist each one having more than 20 years' experience), blinded to RT-PCR results, Explained the HRCT scans and classified them into one of the 3 Categories independently : Category 1 – consonant with multifocal pneumonia; Category 2 – Undetermine for multifocal pneumonia; Category 3 – not consonant with

multifocal pneumonia. Category 1 scans reveal multiple lesions including ground glass opacities (GGOs), nodules, patchy consolidations,crazy paving, nodules with halo,laterality and reverse halo/perilobular pattern irrespective of location. Category 3 patients had CT findings consonant with an alternate identifications. Category 2 patients had undetermine CT chest findings which did not suitable basis for either Category 1 or Category 3. The epidemiological past and signs(fever, dyspnea,cough) were accessible to all 3 radiologists. Kappa Scorewas used to contrast their interpretations for validation and consistency [16].

Favipiravir

Favipiravir is accepted by some countries, including India, for COVID-19 treatment.Favipiravir has shown quick viral clearance and faster clinical development.

Various treatment advices include favipiravir for COVID-19 treatment. Several in progress clinical trials will further proove favipiravir role. Favipiravir is one of the such oral drug that was accepted for new and re emerging wide spread influenza in Japan in 2014 and has shown powerful in vitro activity opposed to severe acute respiratory syndrome coronavirus-2 [17].

It has a broad therapeutic safety margin indicated by a wide CC50/EC50 ratio for a maximum dose. From the clinical trails in COVID-19, it has shown quick viral clearance as contrast to ritonavir/lopinavir(RTV/LPV) and higher level recovery rate than makeover. General, favipiravir has manifest good results in clinical trials including Russia, china and Japan, and many trials are underway in several countries, including UK, USA and India. Now, treatment guidelines from several countries and some states from India have comprise favipiravir in the treatment protocol [18]. Favipiravir has proven effective against a broad range of influenza viruses, including A(H5N1), A(H1N1) pdm09,and A(H7N9) avian virus. additional to that, it may stop the reproduction of many other RNA viruses, which includes phleboviruses,arenaviruses, flaviviruses, hantaviruses, Western equine encephalitis virus,ebola and noroviruses. Favipiravir (prodrug) is a purine base analogue that is changed to active favipiravir ribofuranosyl-5B-triphosphate (favipiravir-RTP) by intracellular phosphoribosylation. It is a carefull and powerful blockade of RNA-dependent RNA

polymerase (RdRp) of RNA viruses. Favipiravir is inserted into the budding viral RNA by error prone viral RdRp, which guides to viral mutagenesis and chain termination. The RdRp surviveing in various types of RNA viruses autorize a broader spectrum of antiviral activities of favipiravir After RNA viral insertion, favipiravir-RTP acts as a mutagen, which is having ability of runoff coronavirus repair machinery. The favipiravir-RTP adds to the force on Corona virus nucleotide content, which so far has a less cytosine (~17.6%) in the SARS-CoV-2 genome. In total, through the greater recurrance of mutation, favipiravir-RTP has a useful efficacy on SARS-CoV-2 by a cytopathic effect, which is persuade by the virus, decreased in the infectious particles and number of viral RNA material. Favipiravir has a potent binding empathy to RdRp with a docking score of −6.925. Hence, favipiravir kills the Achilles heel (RdRp complex) of SARS-CoV-2. [19].

Serology testing (antibody testing)

Serology testing for SARS-CoV-2 is at increased demand so on raised quantify the quantity of cases of COVID. including people that could even be symptom less or have recovered. Serology tests are blood- based tests that can be used to recognize whether people are reveal to a selected pathogen by watching their immune response [20].

Laboratory examinations

Concerning laboratory examinations:

1. within the first stage of the disease, a standard or decreased total white blood cell count (WBC) and a minimized lymphocyte count are often demonstrated.its shocking that, lymphopenia appear to be a negative prognostic factor. Increased values of hepatic enzymes, lactate dehydrogenase (LDH), muscle enzymes,and C-reactive protein are often detected.
2. Unless a bacterial overlap, a standard procalcitonin value is found.The increased neutrophil-to- lymphocyte ratio (NLR), derived NLR ratio (d-NLR)

   [neutrophil count divided by the outcome of WBC count minus neutrophil count], and platelet-to- lymphocyte ratio, are often the declaration of the inflammatory storm [21].

Evaluation

Most countries are utilizing some quite objective and epidemiologic information to determine who should have testing performed. In the US, criteria are developed for persons under investigation (PUI) for COVID-19. In proportion to the U.S. CDC, most patients diagnoised

with COVID-19 have developed fever and/or manifestations of acute respiratory disease (e.g., cough, difficulty breathing). If a private is a PUI, it's recommended that practitioners immediately put in situ infection control and avoidance

measures. Initially, they recommend testing for other sources of tract infection. Additionally, they recommend using epidemiologic factors to assist choose .

There are epidemiologic factors that assist within the selection on who to ascertain . This consists of anyone who has had near touch with a patient with laboratory-established COVID-19 within 14 days ofsymptom a past of travel from affected countries (presently China, Italy, Iran, Japan, and South Korea)within 14 days of symptom onset.

Treatment for COVID-19

Current therapies

Given the shortage of efficacious antiviral treatment against COVID19, its treatment is mainly done according to the therapy of Pneumonia because of COVID19 issued by NHC of Republic of china [22].

Antivirals Remdesir

Developed 100 years ago, this drug failed in clinical trials against Ebola in 2014.But it had been found to be generally safe in people. Research with MERS showed that the drug blocked the virus from replicating.The drug is being tested in many COVID19 clinical trials round the world. This includes studies during which remdesivir is being administered with other drugs,such as the antiinflammatory baricitinib Trusted Source [23]. The Food and Drug Administration announced Monday (June 15) that it's revoking emergency use approval for both hydroxychloroquine and chloroquine—two antimalarial drugs that were initially indicated as a treatment forCOVID19—amid variety of studies that have since shown potentially deadly side effects [24]. A growing amount of knowledge shows that intense inflammation, blood clots, and stroke are a number of the foremost severe manifestation of COVID19. Decades of research have also manifest that apart from lowering cholesterol, statins

decrease inflammation, reduce blood clots, and stop damage to endothelial tissue—the thin layer of cells that line bloodvessels and other organs. That tissue also turn up to be hurting from COVID19. There's also some evidence that statins act as antivirals. due to those effects, epidemiologists like Shakur Still and other researchers want to perceive if statins may be readily available treatment for corona, a disease that has, so far, sickened quite 7.3million people worldwide and killed 416,000 [25].

Glucocorticoids

Routine glucocorticoids administration aren't recommended to use unless there are another indication. Clinical evidence also doesn't support the treatment of corticosteroids. Use of intravenous immunoglobulin might help in case of seriously ill patients. A in detail report of treatment combination of Ardidol, Lopinavir/Ritonavir,and ShufengJiedu Capsule

(SFJDC), a standard Chinese medicine, showed a clinical sake to three of 4 COVID-19 patients. there's an pn process clinical test evaluating the security and efficacy of lopinavir-ritonavir and interferon-α 2b in patients with COVID-19 [26].

Ivermectin

The scientists and doctors continue to discover a way to cure covid a group of Australian researchers were discussing a head lice drug Ivermectin as a practicable treatment to inhibit the viral infection in shorter than 48 hours.The set of findings by Monash University's Biomedicine Discovery Institute (BDI) and the Peter Doherty Institute of Infection and Immunity (Doherty Institute), both in Australia, propose that this drug can quickly inhibit the replication of SARS-CoV-2, the virus that results in covid 19.(18)Ivermectin,is a popular anti-parasitic drug, which acts on SARS-CoV-2 by preventing the viral antigens from entering the host cell nucleus. Recent virtual drug screening identified doxycycline as a capacity to inhibit the SARS-CoV-2 papain-like protease. 5-day course of ivermectin shows end in an earlier clearance of the virus compared to placebo, thus indicating that early intervention with this agent may minimize the viral reproduction within the host cell body. In the 5-day ivermectin group, there was a notable lowering of CRP and LDH by day 7, whichare the

main indicators of disease severity [27].

Vaccines

The construction of SARS-CoV-2 S protein has been revealed, and this could enablethe rapid development and evaluation of medical countermeasures to handle with the on going public healthcrisis [28].

Covaxin

Bharat Biotech has reported around 81% efficacy for Covaxin which they declared as vaccine for the novel covid infection, in large-scale human clinical trials [29].

How the Covaxin work against Covid-19?

The vaccine is similar to CoronaVac (the Chinese vaccine developed by Sinovac)3 in that it uses a complete infective SARS-CoV-2 viral particle comprising of RNA surrounded by a protein shell, but altered so that it cannot replicate.Covaxin available as a two-dose No peer reviewed proof is out there to point out that the vaccine would be effectual against this strain, although a preprint desired promising results [30]. The vaccine is presently being administered in India to people over 60 blurred what percentage are Covaxin (most are Covishield, India's version of the Oxford-AstraZeneca vaccine manufactured in Pune by the Serum Institute of India)

Is Covaxin stack up against other Covid-19 vaccines?

* Covishield, the opposite vaccine getting used within the government's campaign, has an efficacy of around 53 per cent when the 2nd dose is given but 6 weeks after the 1st dose, according to its productinsert [31].

However, the effectiveness of this vaccine, which is predicated on the AstraZeneca-University of Oxford jab AZD1222, varies supported the duration between the primary and second shots. According to

Covishield's product press, this effectiveness changes to just about 79% if the second dose is run at 12 weeks or longer period of time. At an equivalent time, as per the regulatory acceptance to Covishield asof now, the second dose has got to tend 4-6 weeks after the primary dose.

Last month, Sputnik V, the Covid-19 vaccine manufactured by Moscow's Gamaleya Research Institute of Epidemiology and Microbiology, was found to possess an efficacy of 91.6%. This vaccine has been tested in phase 2/3 clinical trials in India by Dr Reddy's Laboratories on around 1,500 volunteers [32].

Covishield

Covishield has been developed by Oxford University together with pharma major Astrazeneca. India's, Serum Institute was their producing and trial partner. Covishield uses a replication-deficient chimpanzee viral vector supported a debilitate version of a standard cold virus (adenovirus) that causes contaminations in chimpanzees and contains the genetic material of the SARS-CoV-2 virus spike protein. After vaccination, the exterior spike protein is built, priming the system to attack against the SARS-CoV-2 virus if it later contaminate the body. The vaccine contains the regimen, advised to be taken 28 daysapart.

Make use of covaxin was approved on?

The Central Drugs and Standards Committee (CDSCO), India's top drug regulator, issued an immediate approval for Covaxin on 3 January 2021,albeit phase 3 clinical trial clinical trials are still ongoing and phase II clinical trial studies are unpublished.14 The regulator cited the necessity for cover against the potential lay out of the united kingdom variant.

and people over 45 with comorbidities, also on doctors . All along of writing, India had administered quite 100 million vaccinations, although it's

subsequent ingredients: L-Histidine hydrochloride monohydrate, L-Histidine, Magnesium chloride hexahydrate, Polysorbate 80, Sucrose, common salt,Disodium edetate dihydrate (EDTA), ethanol and water for injection. Covishield consists of two separate doses of eachone 0.5ml. The second dose should be taken four to 6 weeks after the primary . A person who has had a acute allergic reaction to the first dose of the vaccine,should not be taken the second [33].

The major side effects of the Bharat Biotech Covaxin vaccine?

- Stiffness in the upper arm
- swelling at the site of injection
- Weakness in the injection arm
- Fever
- Body ache

The major side effects of the Serum Institute's Covishield vaccine?

- tenderness, pain, warmth, redness, itching, swelling or bruiding.
- chills or feeling feverish
- joint pain or muscle ache
- lump at the injection site [34]

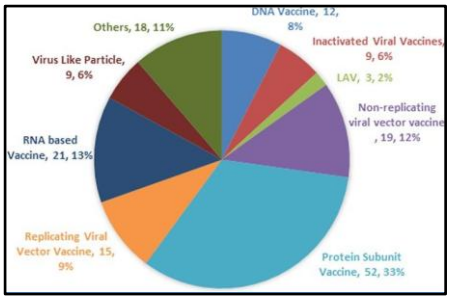

Fig 01: Pie Chart showing the different categories of SARS-CoV-2 vaccines under research [35]

Control and prevention strategies

COVID-19 is clearly a significant disease of international concern. By some estimates it has a better reproductive number than SARS,and more people are reported to possess been infected or died from it than SARS [36] same as to MERS-

CoV,and SARS-CoV disrupting the chain of transmission is taken into account key to stopping the lay out of disease Different plan of action should be implemented in health care settings and at the local and global levels.Health care settings can sadly be a crucial sourceof viral transmission. As shown within the

model for SARS, applying triage, following correct infection control plans, isolating the cases and get in touch with tracing are key to minimize the further spreading of the virus in clinics and hospitals [37]. In addition, if a established COVID-19 case require hospitalization, they necessary to be placed during a single patient room with negative atmospheric pressure – a least of six air changes per hour. Exhausted air has got to be sieve through high efficiency particulate air (HEPA) and medical personnel entering the space should wear personal protective equipment (PPE) like gloves, gown, disposable N95, and eye protection. Once the cases are recovered and discharged, the space should be decontaminated or disinfected and personnel entering the space got to wear PPE particularly facemask, gown, eye protection [38].

Conclusion

This new virus is a crucial challenge for the economic, medical and public health infrastructure of China and to some extent,especially, its neighbours countries. Time alone will tell how the virus will impact our lives here in India. More so, later outbreaks of viruses and pathogens of zoonotic origin are expected(39). So, aside from overcoming this outbreak, plans should be make devise comprehensive to stop later outbreaks of zoonotic origin. COVID-19 wide spread and national lockdown severely obstruct the transporting of many essential works. Unlike expected, lifting of pandemic-associated lockdown served only minimally in improving patient inflow in its initial phases. IN conclusion, subsyndromal mental health problems are a usual reaction to the COVID-19 pandemic. There is a want for more typical research from other high-flown countries, mainly in at risk populations. Working together, we can continue to provide better quality care while decreasing risk to ourselves, patients and public at large. Carefully considering, 'Where to Image', whom to image 'and 'How to Image' has the power to minimize the risks of transmission.

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