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RESEARCH ARTICLE

SYMPTOMS, DIAGNOSIS, TREATMENT AND ACTIONS AGAINST COVID-19

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ABSTRACT

Firstly the novel coronavirus occurred in WUHAN city (CHINA), then it has rapidly spread across China and many other countries. On March 11, 2020, the World Health Organization (WHO) declared the COVID-19 coronavirus disease outbreak a pandemic. The danger of that virus doesn't lay mostly on its lethality but on its strong transmissibility. The clinical symptoms of COVID-19 patients include fever, dry cough, fatigue and sometimes abdominal pain. The elderly and people with underlying chronic diseases represent a higher risk of complications. There still no consensus regarding the best antiviral treatment, but a large variety of drugs have been tested and have shown good outcomes (chloroquine, hydroxychloroquine, Remdesivir, lopinavir and ritonavir…). In this review, we summarized the signs and symptoms, the transmission modes of COVID-19, we detailed the diagnosis and the updates regarding its treatment, and concluded with the epidemiologic state in Morocco and the actions taken by the government to avoid the spreading of the virus.

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INTRODUCTION

By the end of December 2019, WUHAN city (CHINA) faced a mass of pneumonia cases, caused by a novel coronavirus. This coronavirus, was firstly called as the 2019-novel coronavirus (2019-nCoV) on 12 January 2020 by World Health Organization (WHO). By February 2020 WHO officially named the disease (COVID-19) while the International Committee suggested the name SARS-CoV-2 (Guo *et al*., 2020). It has rapidly extent within China and many other countries. So far, 2019-nCoV has affected more than 43 000 patients in 28 countries/regions and has become a major global health concern (Lai, 2020). On March 11, 2020, the World Health Organization (WHO) declared the COVID-19 coronavirus disease outbreak a pandemic. Based on the evidence of a rapidly increasing incidence of infections and the possibility of transmission by asymptomatic carriers , SARS-CoV-2 can spread quickly and effectively among humans and exhibits high potential for a pandemic (Lai, 2020).

MATERIALS AND METHODS

A bibliographic research was conducted on Medline database on Wednesday 2nd April 2020, the Mesh terms used were: "severe acute respiratory syndrome coronavirus 2" AND "COVID-19" The relevant articles related to symptoms, diagnosis, treatment and actions against Covid-19, were selected after quality assessment by two independent authors, then a synthesis was written to provide the current status of the literature concerning covid-19 pandemic.

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Current status of knowledge:

Signs and symptoms: The incubation period (time from exposure to the development of symptoms) of the virus is estimated to be between 2 and 14 days, however exceptions may exist and Possible outliers are from 0 to 27 days (Lai, 2020). Patients with confirmed 2019-nCoV infection mostly had respiratory signs and symptoms, Fever was reported flanked by cough, mostly dry. Dyspnea was very common. A significant proportion of patients complained of gastrointestinal symptoms such as nausea and vomiting. Also myalgia and fatigue appeared during the course of illness (Singh, 2020). Other symptoms less encountered are migrane, diarrhea, runny nose, hemoptysis, and Wet cough. However, The complete clinical manifestation is not clear yet, as the reported symptoms range from mild to severe, with some cases even resulting in death (Lupia, 2020).

Transmission: The latest guidelines from Chinese health authorities described three main transmission routes for the

COVID-19: 1) droplets transmission when an infected person sneezes or choughs 2) contact transmission through surfaces and objects, and 3) aerosol transmission that can happen occur when respiratory droplets stay in the air in a closed environment, creating aerosols and can be inhaled by a person which can cause infection (Lupia, 2020).

Diagnosis: Case definition guidelines mention the following symptoms: fever, reduction in lymphocytes and white blood cells, new pulmonary infiltrates on chest radiography,(Multiple bilateral lobular and subsegmental areas of consolidation or bilateral ground glass opacities)and no improvement in symptoms after 3 days of antibiotics treatment. For suspected patients, the following (RT-PCR) test have been suggested for diagnosis to reveal the positive nucleic acid of SARS-CoV-2 in mucus, gorge swabs, and respiratory excretions (Singh, 2020; Lupia, 2019).

Differential diagnosis: The differential diagnosis involves all types of respiratory viral infections (influenza, parainfluenza, respiratory syncytial virus (RSV), adenovirus, human metapneumovirus, it's very difficult to differentiate COVID-19 from these infections clinically therefore specific tests are required and also travel history becomes important. However, as the epidemic spreads, the travel history will become irrelevant (Adhikari, 2019).

Treatment:

Current therapies: Current treatments mostly concentrate on symptomatic and breathing support. Nearly all patients accepted oxygen therapy, and WHO suggested extracorporeal membrane oxygenation (ECMO) to patients with refractory hypoxemia . Rescue treatment with convalescent plasma and immunoglobulin G are delivered to some critical cases according to their condition (Guo *et al*., 2020)

Antiviral treatments: Usual antiviral drugs and corticosteroid treatment, are inacceptable for COVID-19 and not recommended. Remdesivirexhibitsa good antiviral activity against several RNA viruses. Many invitro tests and mouse studies stated that remdesivir could inhibit the NSP12 polymerase. Remdesivir has been reported to treat many cases of COVID-19 effectively (Guo, 2019). Chloroquine and hydroxychloroquine have great potential to treat COVID-19. Both are usually prescribed for treating malaria, with an antiviral propriety. However the hydroxychloroquine has less side effects. A combination of remdesivir and chloroquine was proven to effectively inhibit the virus invitro. A French scientist D. Raoult suggested for his patients, in his clinical trial, the association of hydroxychloroquine and Azithromycin and concluded that hydroxychloroquine treatment leads to viral load reduction/disappearance in COVID-19 patients and its influence is strengthened by azithromycin (Singhal, 2019; Raoult *et al*., 2020). Scientists previously confirmed that the protease inhibitors lopinavir and ritonavir, used to treat infection with human immunodeficiency virus (HIV), were useful for treating MERS-CoV and SARS- CoV patients. It has been stated that β-coronavirus viral loads of a COVID-19 patient reduced after lopinavir/ritonavir treatment (Guo *et al*., 2019). Additionally, clinicians combined Chinese and Western medicine treatment including lopinavir/ritonavir, and Shufeng Jiedu Capsule (SFJDC, a traditional Chinese medicine) and patients felt significant improvement. other suggested antiviral drugs involve: nitazoxanide, favipiravir, nafamostat…(Guo, 2019). A recent study by Wang *et al*. revealed that remdesivir and chloroquine were successful treatments in the control of SARS-CoV-2in vitro. In addition, an angiotensin-converting enzyme 2 (ACE2)-based peptide, 3CLpro in- hibitor (3CLpro-1) and a novel vinylsulfone protease inhibitor, theoretically, appear to be effective against SARS-CoV2 (Lai, 2020). Some unverified reports indicated that inhibitors of SARS-CoV-2 replication including chloroquine are clinical useful against declared SARS- CoV-2 infection. If these findings are confirmed, chloroquine might be used to prophylactically treat vulnerable individuals (in particular the elderly and patients with chronical diseases) that have a high risk of viral exposure (Gautret, 2020).

Prognosis: The super infection if very common and its risk of occurrence increased if the patient is in the intensive care unit. Eldery and patients with underlying sickness are more likely to bad prognosis or death the other ranges of patients had a good prognosis (Singh, 2020). As of 1 March 2020, a total of 79,968 confirmed cases, including 14,475 (18.1%) with severe ill- ness, and 2873 deaths (3.5%) in mainland China had been reported by WHO (Guo *et al*., 2020; Lai, 2020). Complications comprised acute respiratory distress syndrome (ARDS), arrhythmia shock, acute kidney injury, acute cardiac injury, liver dysfunction and secondary infection. The disease leans to be more aggressive in elderly people, especially for people aged 65 years or more. Neonates and the elderly requiremore attention and care due to their immature or feeble immune system (Guo *et al*., 2020).

Epidemiologic data in morocco: The 2nd March the first case of covid-19 appeared in Morocco , coming from Italy, the 3rd April the total of confirmed cases was 735 case among them 49 were recovered and 47 dead.Upto the 29TH April the total of confirmed cases was 4321case among them 928 were recovered and 168 dead.

Moroccan actions against Covid-19: Schools were requested to close by the 16th march 2020, and the e-learning replaced the attending courses for all levels. Schools and public places like museums, monuments, libraries and tourist sites, were closed, all shops were closed except those of food and essential things and public sporting events and other mass gatherings were prohibited. Drastic border closure measures were adopted urgently by Morocco in mid-March to limit the Covid-19 pandemic. About 19th march 2020 leaving home was restricted for all the population except medical staff, police and other assistant staff. In suspected cases, the patient is ordered to stay home and call the emergency and it's formally restricted that he goes himself to the biologic laboratory for doing the test. The telecommuting replaced work. All breaks for professional healthcare persons were suspended.

Two official websites were created: https://www.marocovid.com/ And http://www.covidmaroc.ma for following the updates about the spreading of covid19 in Morocco , and also informing people. Up to date the pic of the epidemic in morocco wasn't noticed yet, which means that despite all of these preventive measures, the virus is still spreading in the country. The strategy of Morocco was based on case isolation, contact tracing, and preventing transmission by contacts who are infected. Which was found to be sufficient, in the study of Hellwellt and al., to control a new COVID-19 outbreak in the absence of other control measures (Hellewell *et al*., 2020).

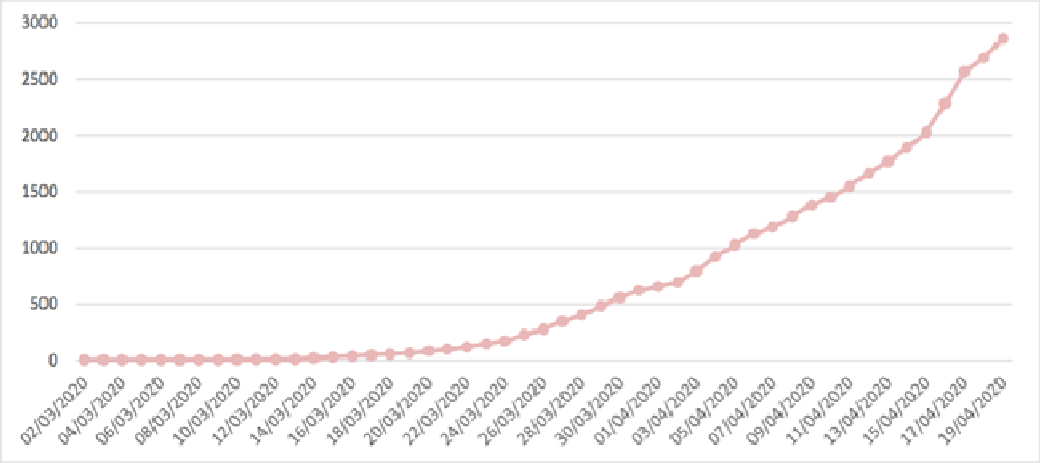

Figure 1. Diagram representing the curve of confirmed cases by days

Maryam Bigdeli, representative of the World Health Organization (WHO) in Morocco, said that the national monitoring, preparedness and response system was developed after WHO's evaluation. She believes that Morocco has the human and technical resources necessary to face the coronavirus. The Tuesday 7th April, the wearing of the face mask became obligatory in morocco, and the government asked the factories to start producing them locally.

Actions related to the dental health-care: The dental practice was limited to the emergency cases: trauma, hemorrhage, severe dental pain (pulpitis). The protective measures were emphasized: FFP2 masks, and protective face shields, and Long-sleeved gown, double gloves. All the non-urgent procedures were postponed. All procedures were done by manual instruments rather than rotative one to reduce and avoid production of droplets.

Conclusion

The epidemic of COVID-19 occurred firstly in China but rapidly and has spread to more than 85 countries/territories/areas outside of China. Many scientists groups are working on therapies and vaccines against the SARS-CoV-2. The supporting treatments, combined with potent antiviral drugs, such as Remdesivir, Chloroquine, or Lopinavir/Ritonavir, have shown a positive effect on treating COVID-19 patients, while concrete data from more clinical trials are still necessary.

Care should be intensive for the elderly and people with certain underlying medical conditions, which requires more attention. In some countries government and authorities have launched psychological intervention. Facing this pandemic with appropriate measures constitute a real challenge for all the world countries, waiting for an adequate vaccine.

What is already know on this topic

- Covid-19 has been declared as a pandemic by the WHO
- Patients with confirmed 2019-nCoV infection mostly had respiratory signs and symptoms, Fever was reported flanked by cough, mostly dry. Dyspnea was very common.
- No consent towards the treatment of covid-19

What this study adds

- Case isolation, contact tracing, and preventing transmission by contacts is a good strategy against Covid-19
- There is a possibility of transmission by asymptomatic carriers
- The association of hydroxychloroquine and Azithromycin provide a viral load reduction/disappearance in COVID-19 patients

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Authors' contributions

I.B. performed the literature review and wrote the paper; A.A. helped with the review and writing of the paper and revised the manuscript, all authors read and approved the final manuscript.

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