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Review

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COVID-19 IN PRIMARY HEALTHCARE

BİRİNCİ BASAMAKTA COVID-19

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Öz

Koronavirüsler, hayvanları veya insanları enfekte edebilen ve Orta Doğu Solunum Sendromu (MERS) ve Şiddetli Akut Solunum Sendromu (SARS) gibi hastalıklara neden olan büyük bir virüs ailesidir. Yeni koronavirüs (SARS-CoV-2) Aralık 2019'da Wuhan şehrinde ortaya çıkan ve pnömoni, pulmoner ödem, ARDS, multiorgan yetmezliği ve ölüme sebebiyet verebilen bir solunum yolu enfeksiyon etkenidir. Tedavi çalışmaları devam etmekle birlikte şu an hidroksiklorokin, azitromisin, plazma tedavisi ve favipiravir gibi anti-viraller öne çıkan tedavilerdir. Hastalığın ölüm oranı %3,8'dir. Yayılımın azalmasını sağlamak amacıyla yasal düzenlemeler yapılmıştır. Aile sağlığı merkezleri (ASM) çocuk, gebe, yaşlı, kronik hastalığı olan hastalar ve birtakım sağlık belgeleri için başvuran kişilere hizmet veren birinci basamak sağlık kurumlarıdır. Pandemi varlığında aile hekimleri, ASM'lere başvuran kişiler arasında virüs iletimini kısıtlamak zorundadır. Bu nedenle triaj yapılması yüksek riskli hastaları mümkün olan en kısa sürede saptamak için gereklidir. ASM'lere başvuran tüm hastalar bu şekilde korunabilir. Filyasyon yapıldıktan sonra, şüpheli vakalar veya COVID-19 ile temas eden vakalar aile hekimleri tarafından klinik durumlarının takip edilmesi ve izolasyon koşullarının kontrol edilmesi amacıyla günlük olarak takip edilmektedir. Tüm bu nedenlerden ötürü, COVID-19 ile mücadele eden aile sağlığı merkezlerini incelemeyi amaçladık.

Anahtar Kelimeler: COVID-19, SARS-CoV-2, pandemik, aile hekimliği, temel sağlık hizmeti.

Abstract

The coronaviruses are a large family of viruses infecting animals or humans and causing diseases, including Middle East Respiratory Syndrome(MERS, MERS-CoV) and Severe Acute Respiratory Syndrome(SARS, SARS-CoV). The novel coronavirus SARS-CoV-2 emerged in December 2019 at the city of Wuhan, affecting the respiratory system leading to pneumonia, pulmonary edema, Acute Respiratory Distress Syndrome, multiorgan failure, and death. Treatment studies are still ongoing, but hydroxychloroquine, azithromycin, oseltamivir, favipiravir with some other anti-virals, and convalescent plasma therapy are prominent. The mortality rate of disease is 3.8% in the world, infesting many countries. Legal regulations have been made for the public to reduce transmission. Family health centers are providing healthcare services to every individual, for example, children, pregnant, patients with chronic diseases, patients with any complaint, and individuals who applied for health papers. In such a pandemic family, physicians also have to restrain the transmission of viruses between those people who applied. Therefore triage is needed to determine the high-risk patients as soon as possible. Both of them and other patients are protected in that way. After the filiation is done, suspected cases or COVID-19 contacted cases are kept in touch by family physicians to follow up their clinical status and check for isolation conditions. For all these reasons, we aimed to examine the family health centers coping with COVID-19.

Keywords: COVID-19, SARS-CoV-2, pandemics, family practice, primary health care.

Introduction

The coronaviruses are a large family of viruses infecting animals or humans and causing diseases, including Middle East Respiratory Syndrome(MERS, MERS-CoV) and Severe Acute Respiratory Syndrome(SARS, SARS-CoV). SARS, as a viral respiratory tract infection, infected more than 8000 people in 37 countries and caused death of 774 people, in 2002. Mortality rate was 9.6% and was isolated on the Himalayan masked palm civets. Turkey, had not reported any SARS case.[1,2]

MERS is also a respiratory tract infection which was detected in Saudi Arabia , in 2012 and to day infected 2519 people in 27 countries and causing death of 866 people. Mortality rate is 34.3%. Humans are thought to be infected by dromedary camels and human-to-human transmission is very rare except for close contact.[3]

Third zoonotic human coronavirus disease of 21th century emerged in December,2019, city of Wuhan. There were a group of pneumonia cases of unknown cause and were somehow related to the Huanan seafood market.[4] In January, 2020, that virus is named shortly SARS-CoV-2, which is enveloped, positive-sense, single stranded RNA viruses. The disease caused was named COVID-19. [5,6]

Transmission

Coronaviruses causes diseases on humans by spreading from animals. Avians, camels, bats, mice, dogs, masked palm civets and cats are hosts. But many coronavirus types don't cause illness on humans. Transmission is mainly by droplets and indirect contact.[7]

Droplets: Droplets are small particles larger than size of 5µm. They can't stay in the air for long periods and can't spread to wide range of areas. Aerosols are smaller than size of 5µm particles containing virus. Droplets spread from hosts by coughing, sneezing, talking, laughter and aerosols spread by medical procedures like, bronchoscopy, intubation or aspiration can reach 1-2 meters ; can infect conjunctiva, oral and nasal mucosa. SARS-CoV-2 viruses can survive up to 3 hours in an aerosol with a half-life of 1.1-1.2 hours.[8]

Indirect contact: That means carrying the infecting agent with an intermediate object or a fomite. In that way of contamination, secretions from respiratory tract of diseased person contact with the susceptible host's hand and host can touch conjunctiva, oral and nasal mucosa with them.

SARS-CoV-2 viruses can survive:

-On copper up to 4 hours (median half-life of 1.1-1.2 hours)

-On cardboard up to 24 hour (median half-life of 3.5 hours)

-On stainless steel up to 2 days (median half-life of 5.6 hours)

-On plastic up to 3 days (median half-life of 6.8 hours). [8]

Incubation period of SARS-CoV-2 changes from 2 to 14 days with a mean of 5-6 days.[6] Secondary attack rate varies in different populations 1 to 5 %.[9] In a research conducted in U.S. , 10 COVID-19 patients and their 445 close contacts were evaluated and secondary attack rate was found to be 0.45%.[10]

Contamination from asymptomatic people or from in the incubation period is described however it's not very well known to what extent it occurs. In a research in Singapore, secondary attack rate from asymptomatic people is stated 6.4% .[11]

SARS-CoV-2 also seen in stool samples in the report published by China and WHO, but this was stated not to be important in transmission of COVID-19.[9]

Symptoms and Signs

Coronavirus generally causes respiratory tract infections in humans. The disease causes 81% asymptomatic or mild, 14% serious and 5% critical illness. Pneumonia, pulmonary edema, Acute Respiratory Distress Syndrome(ARDS), multiorgan failure and death may occur. Although symptoms generally manifest with fever, dry cough, dyspnea, there are case studies in the literature showing various complaints like headache, nasal congestion, sore throat, muscle and joint pain, weakness, nausea / vomiting and diarrhea may occur (Table 1).[12–16] Pneumonia is the primary cause(91%) of hospitalization.[16]

Diagnosis

Laboratory Tests

Blood samples: Blood tests are not diagnostic. Mostly lymphopenia and leukopenia are seen. In a meta-analysis, Laboratory findings were leukocytosis in 11%, leukopenia in 36.9%, lymphopenia in 57.4%, elevated C-reactive protein (CRP) in 61.3%, elevated lactate dehydrogenase (LDH) in 57% of results. In some patients, increased liver function tests, creatinine kinase, D-dimer values were observed.[17]

Table 1. Distribution of Symptoms for COVID-19 in Literature

	Wang C. et al. n (%)	Chen N. et al. n (%)	Wang D. et al. n (%)	Tian S. et al. n (%)	Guan et al. n (%)
Fever (≥38°C)	40 (98)	82 (83)	136 (98.6)	105(40)	235 (21.7)
Cough	31 (76)	81 (82)	82 (59.4)	120 (45.8)	745 (67.8)
Dyspnea	22 (55)	31 (31)	43 (31.2)	18 (6.9)	205 (18.7)
Muscle pain	-	11 (11)	48 (34.8)	-	164 (14.9)
Confusion	-	9 (9)	-	-	-
Headache	-	8 (8)	9 (6.5)	17 (6.5)	150 (13.6)
Sore throat	-	5 (5)	24 (17.4)	-	153 (13.9)
Nasal congestion	-	4 (4)	-	-	53 (4.3)
Chest pain	-	2 (2)	-	-	-
Diarrhea	1 (3)	2 (2)	14 (10.1)	-	42 (3.8)
Nausea and Vomiting	-	1 (1)	5 (5.6) nausea 14 (10.1) vomiting	-	55 (5)
Weakness	-	-	96 (69.6)	69 (26.3)	419 (38.1)
Total Case	41 (100)	99 (100)	138 (100)	262 (100)	1099 (100)

Real Time Polymerase Chain Reaction (RT-PCR): That methods is used to determine the virus presence on respiratory secretions and first choice of testing for diagnosis. In a 205 patient study, 1070 specimens collected from them showed positive rates of 93% in bronchoalveolar lavage fluid, 72% in sputum, 63% in nasal swabs, 46% in fibro bronchoscope brush biopsies, 32% in pharyngeal swabs and 29% in feces.[18] RT-PCR may give false negative results. While its sensitivity on first 7 days of disease is 67% , after 15th day decreases to 45%.[19] When sampling from the upper respiratory tract, from the oropharynx and then the nasopharynx the same swab must be used and sent to lab in the same medium. Yet, the difficulties or problems with the sampling and transfer may affect the result.[20]

Serological testing: Viral serological tests are effective methods in SARS-CoV-2 diagnosis. After 15th day , IgM and IgG antibodies show sensitivity of 94% and 80% in COVID-19.[19] Evaluating IgM, IgG and RT-PCR together can provide information about the infection period.

-RT-PCR (+), IgM (-), IgG (-); window period,

-RT-PCR (+), IgM (+), IgG (-); early periods of the infection,

-RT-PCR (+), IgM (-), IgG (+); late period of the infection or recurring,

-RT-PCR (-), IgM (-), IgG (+); infected and cured,

-RT-PCR (-), IgM (+), IgG (-); window period,

-RT-PCR (-), IgM (+), IgG (+); cure period or RT-PCR false negative. [21]

Radiological Studies

Postero-anterior Chest X-ray: The sensitivity of Chest x-ray is 30-60%.[22] At early stages of disease images can be found normal and that doesn't exclude pneumonia. Especially children and young adults Chest X-ray should be first choice of imaging.

Computerized Tomography(CT): Characteristic chest CT findings are widespread peripheral and bilateral involvement mostly starting from the middle-lower zones, ground glass opacities, consolidations, crazy-paving appearance, air bronchogram, vascular dilation and bronchial changes.[23] In a retrospective study conducted with 1,014 patients in China, the accuracy of CT was 97%, specificity 25% and accuracy in detecting COVID-19 as 68%; positive predictive and negative predictive values were 65% and 83%, respectively.[24]

Based on whole data, it is concluded that the evaluation by RT-PCR alone may be insufficient for the diagnosis of COVID-19.

Treatment

Since SARS-CoV-2 is a newly identified virus, there is no effective antiviral treatment yet. The main treatment is symptomatic, but in many studies, antiviral drugs such as oseltamivir, ribavirin, ganciclovir, remdesivir, lopinavir and ritonavir have been used to reduce viral load and prevent a possible respiratory complication.[4,6,13,14] However, randomized controlled trials are needed to confirm the effectiveness of all these antiviral drugs in COVID-19 treatment.

Chloroquine (CQ) is commonly used as an antimalarial, hydroxychloroquine (HCQ) is widely used in autoimmune diseases such as lupus, rheumatoid arthritis. Antiviral efficacy has been demonstrated by in vitro studies in the late 1960s.[25] Later in 2000s, both CQ and HCQ were found to have antiviral activity on many

viruses such as SARS, MERS, Ebola in cell cultures.[26] Recent studies have shown that CQ or HCQ SARS-CoV-2 are effective in controlling infection, and CQ prevents exacerbation of pneumonia, improves radiological findings in the lung, shortens the course of the disease and prevents viral spread in the postinfectious period.[27,28] HCQ comes forward because it is safer than CQ.[29]

In a study, it was stated that HCQ and azithromycin had a synergistic effect and in the patient group using this combination, there was a significant decrease in viral load and viral transmission times compared to the control groups on the sixth day of treatment. Both HCQ and azithromycin prolong the QT interval. In a review, patients using HCQ were evaluated based on the development of toxicity, and it was found later on that 85% of them had conduction disorders, 26.8% heart failure, 22% ventricular hypertrophy, and 9.4% hypokinesia.[30] Therefore it is recommended to record the QRS duration, PR and corrected QT intervals of patients with 12-lead ECG before starting treatment in patients planning combination therapy with HCQ. In the patient who has already started treatment, it is recommended to make that examination approximately 3 hours after the second dose of HCQ loading dose on the first day of treatment.[31] It is recommended that patients who have risk factors like, advanced age, cardiac comorbidity, electrolyte disturbance, or use other drugs that prolong QT duration should be evaluated for risk and should be consulted to cardiology if necessary.[20]

The treatments currently applied in our country according to disease' stage are given in Figure 1 and Figure 2.[20] However, as experience on COVID-19 increases updates and changes are made in treatment and application forms. These figures are prepared according to the 14.04.2020 dated guide.

Patients whose clinical status or pneumonia findings worsen while taking HCQ treatment may be considered to start favipiravir treatment at the doses indicated in Figure 2, and HCQ treatment should be completed to 10 days.

In uncomplicated possible or diagnosed COVID-19 pregnant cases, first step in therapy is follow-up without drug treatment. However, drugs should be considered in the presence of risk factor or clinical deterioration (Figure 3).[20]

Promising Drugs for COVID-19 Treatment

Lopinavir and ritonavir are protease inhibitors used in HIV treatment. Antiviral activities have been reported for MERS and SARS viruses, but their efficacy in SARS-CoV-2 therapy is controversial.

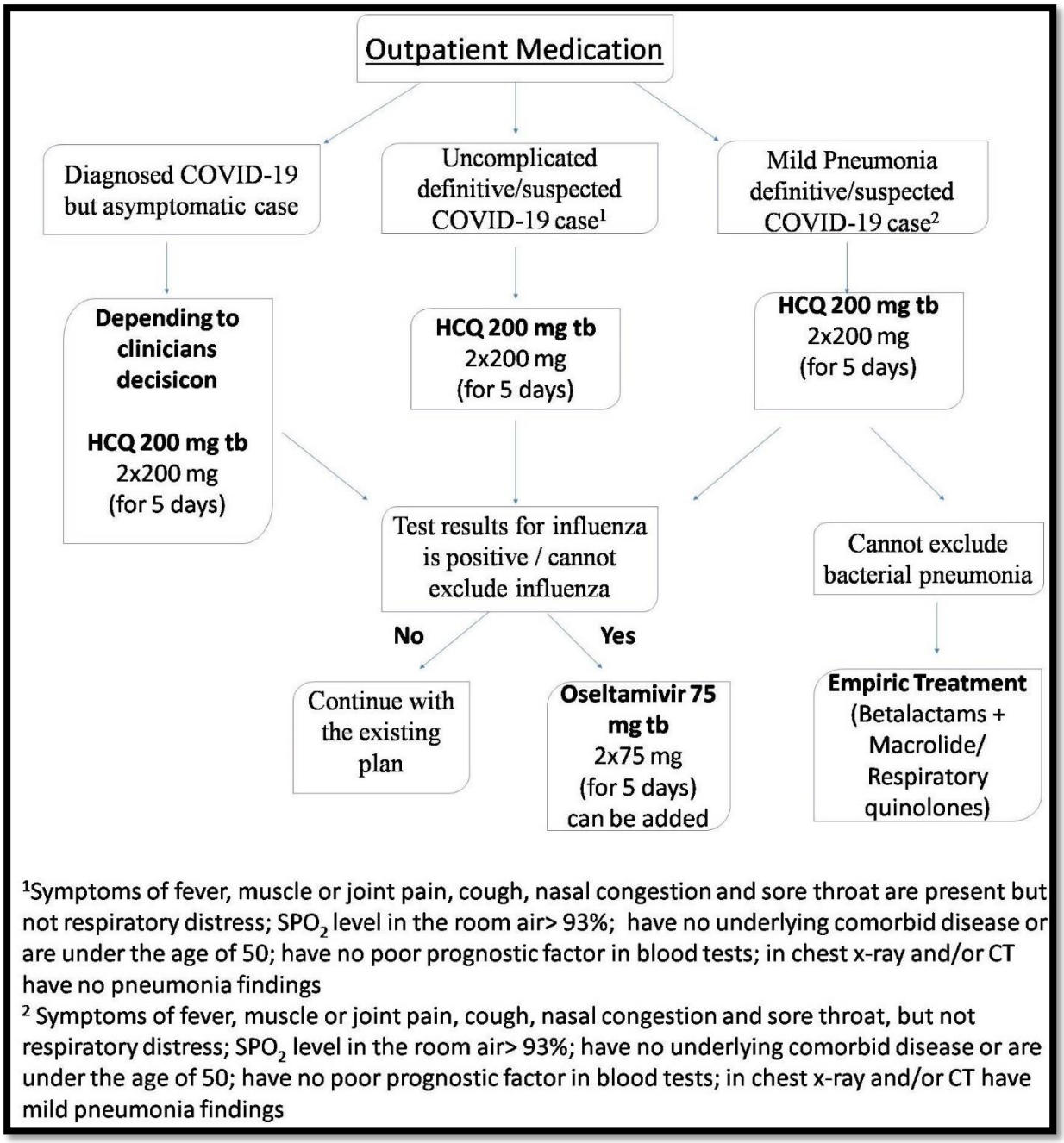

Figure1. Treatment plan suggested for diagnosed/suspected COVID-19 Patients to be followed as outpatient

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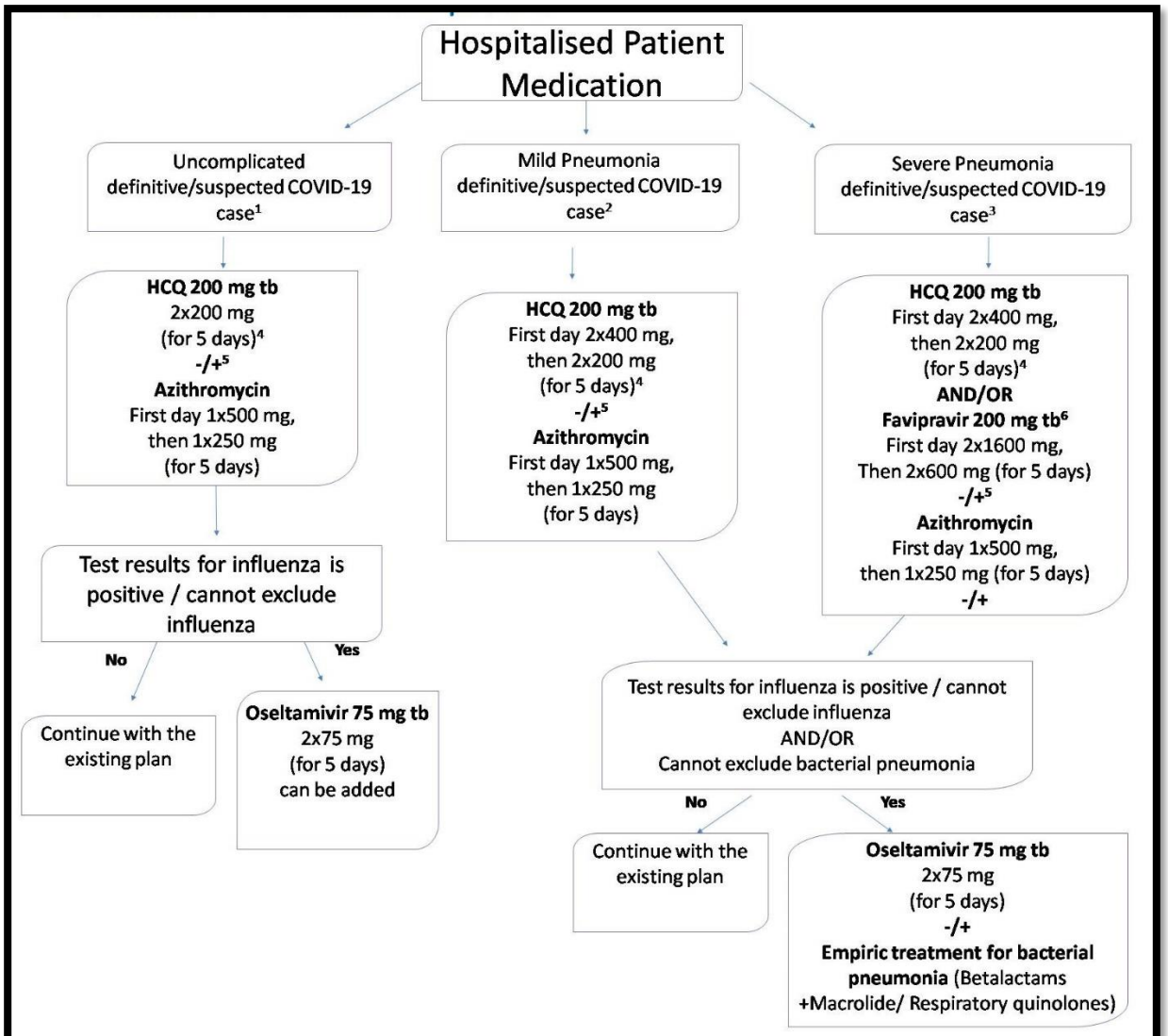

[1]Symptoms of fever, muscle or joint pain, cough, nasal congestion and sore throat are present but not respiratory distress; SPO_2 level in the room air> 93%; have no underlying comorbid disease or are under the age of 50; have no poor prognostic factor in blood tests; in chest x-ray and/or CT have no pneumonia findings

[2] Symptoms of fever, muscle or joint pain, cough, nasal congestion and sore throat, but not respiratory distress; SPO_2 level in the room air> 93%; have no underlying comorbid disease or are under the age of 50; have no poor prognostic factor in blood tests; in chest x-ray and/or CT have mild pneumonia findings

[3] Patients with SPO_2 level in the room air > 90%, 30 /min solunum of breathing, in chest x-ray and/or CT have pneumonia findings or have acute organ dysfunction

[4] In the patients with good clinical response to treatment but symptoms persist at the end of day 5 , treatment may be extended to 7-10 days.

[5]In the presence of risk factor, physician's decides to start. Concomitant use of HCQ with azithromycin may prolong the QT interval.

[6] It is not recommended for use in pregnant and lactation.

Figure 2. Treatment plan suggested for diagnosed/suspected COVID-19 Patients to be followed as inpatient

Ribavirin is a nucleotide analogue used in the treatment of Hepatitis C virus, Respiratory Syncytial Virus, SARS and MERS viruses. There is no clear evidence on its efficacy and safety, and it can cause anemia at high doses.[26]

Favipiravir is a guanine analogue used in the treatment of infections such as influenza, Ebola, yellow fever, norovirus and enterovirus related diseases. Recent studies have shown that the virus has antiviral effects in Vero E6 cells and can be therapeutic for COVID-19.[27]

Remdesivir is an adenosine analogue. It showed antiviral activity for MERS-CoV and SARS-CoV in the human respiratory epithelium and inhibited MERS-CoV replication in mice. It was firstly developed and used for Ebola treatment. It is one of the promising treatment candidates for SARS-CoV-2. However, clinical studies are needed to confirm therapeutic activity and safety of both favipiravir and remdesivir.[26]

Convalescent plasma therapy is a passive immunity method that is given to the susceptible person by delivering antibodies collected from people who have previously been infected with the virus. Its effects have seen in recent years against many viral pathogens, including MERS and SARS viruses. It is a promising treatment, but its safety and efficacy for COVID-19 has not been demonstrated yet.[32]

Darunavir, imatinib, interferon alpha, teicoplanin and many more drugs are considered to be potential drugs for the treatment of COVID-19, but there is no effective and safe drug specific to virus yet.[33]

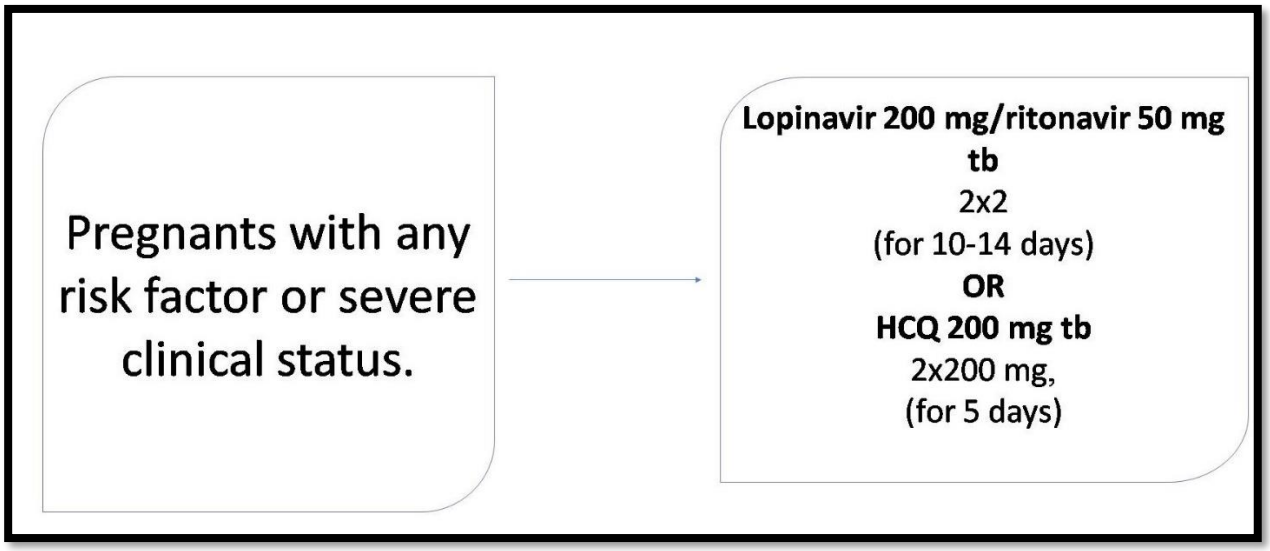

Figure 3. Treatment plan for pregnant

Prognosis

The mortality of COVID-19 is 3.8%(20) In our country, mortality rate is 2.1% and these are lower than SARS and MERS. In the presence of severe ARDS, approximately 50% of patients have a mortal clinical course. However, male gender, advanced age (≥64), presence of comorbidities (hypertension, diabetes, cancer, chronic heart, lung or kidney diseases), severe lymphopenia (<800/µl), elevated liver function tests, LDH, CRP (> 40 mg/l), ferritin (> 500 ng/ml), D-dimer (> 1000ng/ml), kidney function tests and increased prothrombin time are poor prognostic factors.[34]

In the study by Miller A. et al., It was found that the countries which started BCG vaccination in earlier years or countries where BCG vaccine has been administered for longer years have a lower mortality rate associated with COVID-19 per million population.[35]

Infectivity after treatment

After the COVID-19 treatment, in the patient who had no symptoms and had two negative oropharynx RT-PCR result taken 24 hours apart, it was found to be positive result on third day. The infectious period of COVID-19 disease is not yet fully known. People in the recovery period may also be contagious. Therefore, it is recommended that quarantine be continued for 14 days after therapy.[36]

Prevention

Chemoprophylaxis

It is thought CQ (and possibly HCQ by the similar mechanism) to inhibit SARS-CoV-2 spread before and after infection, so can be used for both prophylactic and therapeutic purposes for COVID-19.[37] It is not yet recommended by the CDC due to the lack of randomized controlled trials on its dosing and duration.[38] However, the Medical Research Council of India provides HCQ to all healthcare workers who were in contact with suspected / definitive COVID-19 cases, uses oral on the first day 400mg 2 x 1, then 400mg once a week for seven weeks. They also recommends the oral use of 400 mg 2 x 1 for first day then 400 mg once a week for three weeks to asymptomatic household who were in contact with a diagnosed COVID-19 patient.[39]

Vaccination

Globally, there are about 15 potential vaccine candidates with developed technologies and techniques, but It is estimated to take more than a year for most of them to begin phase 1 clinical trials. Safety and immunogenetic clinical trials are taking place with 45 volunteers on an RNA vaccine (mRNA-1273) developed in the United

States. Another vaccine candidate developed in China is the recombinant adenovirus vaccine (Ad5-nCoV) and phase 1 clinical trials continue with 108 healthy people.[38]

A possible secondary influenza or bacterial infection added to COVID-19 may increase the risk of morbidity and mortality. Therefore, in line with WHO recommendation, regardless of COVID-19 pandemic, it is highly recommended to apply vaccines, which are protective against respiratory infections such as influenza and pneumococcal diseases.[40]

Advice for the Public

People with COVID-19 suspect or diagnosis must isolate themselves from the community for 14 days. In case of any need of contact, they should definitely use a medical mask and there should be at least 1-meter distance between each person around. At home, if possible, the sick person should have a separate bathroom and bedroom. If it is not possible, it is necessary to use a medical mask, to maintain the social distance and to frequently ventilate the room while sharing the same room with other people.

It is recommended to use a medical mask in case the people who care for the patient enters the patient's room, to use gloves and apron besides the mask in cases that require direct contact with the patient or the patient's waste. Although WHO does not recommend the use of personal protective equipment in public areas in the community without any symptoms, in our country in the circular issued by the Ministry of the Interior on 03.04.2020, citizens and employees were required to wear masks at market places, markets, crowded covered all work places. It is stated that citizens will not be allowed to go out on the streets regardless of their social distance.[41,42] Mask policies became the subject of controversy worldwide. However, after the asymptomatic transmission is partially understood, it is very important for every individual to wear mask especially when getting in contact with other people.[43]

Risk and Case Management in Primary Care

Family Health Centers are centers with multiple service offerings in primary health care. On the one hand, they provide outpatient clinic services to patients from all ages, complaints or diseases and on the other hand, provide protective services to healthy individuals. For this reason, triage and daily work plan in the family health center are crucial for preventing contamination.

At this point, triage is needed to identify the risky patient, if possible, before entering the building of the family health center. The Ministry of Health's "Possible COVID-19 Case Inquiry Form" should be used. Three important symptoms that should be asked to the patient in triage are fever or recent presence, cough and difficulty in breathing. If they are not present, the questions are asked whether he / she or someone from the household

came from abroad in the last 14 days, hospitalization related to the respiratory tract problem in the last 14 days of someone known, or a diagnosis of COVID-19. Any confirmatory answer to these questions makes the patient at the high-risk category of possible COVID-19, at first sight. The individual at high risk should be further assessed in a separate pre-prepared room.[20]

The examination of patients with low risk can be continued according to normal outpatient clinic conditions, but it should not be forgotten that; asymptomatic contamination is a critical condition for COVID-19. In addition, a different examination finding, complaint or clinic history that may be overlooked in the triage evaluation may yield risky results in the patient. For all these reasons, it is recommended that almost every examination at the family health center be carried out with great care and protective equipment support.

The algorithm in Figure 4 can be used in terms of how people who apply to family health center are directed according to their complaints, reasons to apply and clinical risk situations.[20,42,44,45]

Exposure of Healthcare Workers, Personal Protective Equipment

Area for Triage and COVID-19

The area to be used for triage should be located near the entrance of the family health center. Proper conditions to measure temperature with non-contact thermometers and enough space to keep 1-meter distance with ne patient needed. The minimum item must exist in that area or room. Likewise, in the prepared room reserved for COVID-19, the items should be minimized and the examination table and equipment conditions required for the consultation should not be missing. It is important that unnecessary entrance and exit to the room must be limited and the materials cannot be changed place continuously. Single use products should be selected if possible on equipment and table covers.

Advice for Cleaning

It is shown in Table 2 some practical advice for cleaning the areas, fixture and equipments.[20,46,47]

Personal Protective Equipment

Among the personal protective equipment (PPE), medical masks, gloves and coveralls should be disposable.

Medical mask is water resistant. It protects wearer against large droplets, body fluids, splashes and flushes of fluids. However, it does not reliably protect from small airborne particles and is not considered respiratory protective. Latter should be discarded when wet, moist or after each patient. It must be disposable.

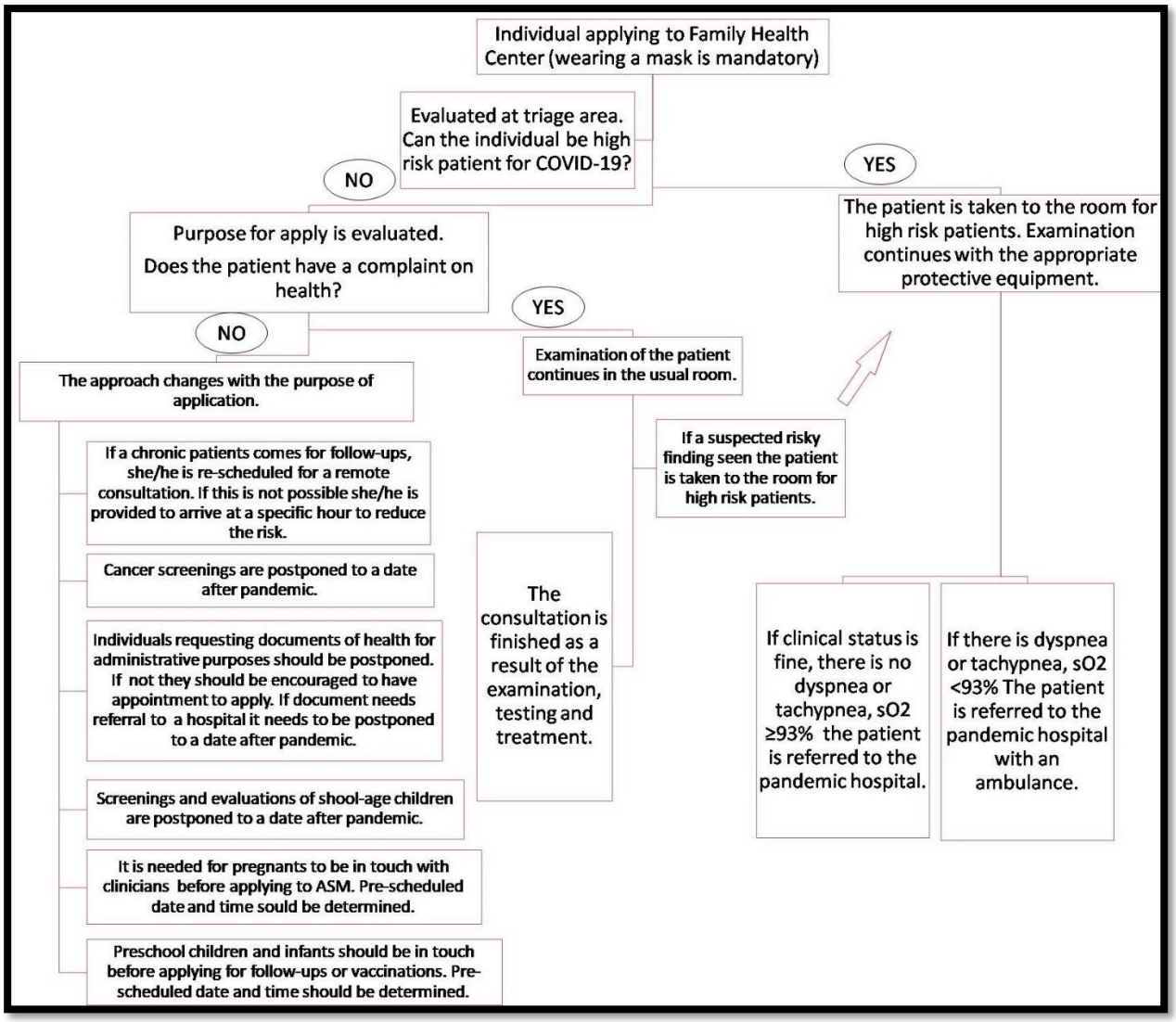

Figure 4. Algorithm for patients applying to family health center

N95 is the air filtration standard used in the United States. This refers to how much of the standard mask can filter particles of size 0.3 microns. N95 masks which also can be named respirators, protect users against small particles of aerosols and large droplets. They filter 95% of large and small particles. Accordingly, N95 masks have the capacity to filter 95% of particles, 97% of N97 masks and 99.97% of N100 masks. FFP masks are the European version of the N95 classification. FFP1 masks have the capacity to filter 80%, FFP2 masks 94% and FFP3 masks can filter 99.95% of the particles according to the 0.3 micron particle filtering capacity.[48]

The mask should be placed on the face properly. It should be discarded when damaged, got wet, contaminated with body fluids. As a suggestion in the guides, the replacement of the N95 mask is recommended in every risk patient.[49] However, a worldwide pandemic may diminish any equipment. If there is no possibility to change in

that frequency, during the evaluation of high-risk patients, wearing a medical mask in front of the N95 mask and changing the medical mask after that patient may be an option for difficult times.

Table 2. Some practical recommendations for cleaning the family health center

	Disinfecting agent	**Recommendations**
Areas for COVID-19		It should not be forgotten to ventilate the room after the patient. Then cleaning starts.
Surface cleaning and surfaces where body fluids can scatter	Standard Bleach-Sodium hypochlorite (1:10 dilution)	All surfaces and outer parts of items are wiped off after the high risk patient. Cleaning starts from the highest or the hardest to reach area. Organic materials should be swept first. If possible, the cleaning cloths must be disposable.
Floor cleaning	Standard Bleach-Sodium hypochlorite (1:10 dilution) or Accelerated Hydrogen Peroxide 0.5%	
All other surfaces and floors		
Surface cleaning	Standard Bleach-Sodium hypochlorite (1:100 dilution)	Seats in the waiting area should not be forgotten. It should be cleaned twice a day.
Floor cleaning	Standard Bleach-Sodium hypochlorite (1:100 dilution) or Accelerated Hydrogen Peroxide 0.5%	It should be cleaned twice a day.
Examination room		All items should be minimized in the examination room and physician's desks.
Examination tables	Standard Bleach-Sodium hypochlorite (1:100 dilution)	Coverings should be disposable
Stethoscope, otoscope, pulse oximetry devices and other needed materials	Alcohol Solutions (Ethyl / isopropyl) (at least 70%)	Disinfection should be provided after each patient.
Physicians' desk, computer and other stuffs.	Alcohol Solutions (Ethyl / isopropyl) (at least 70%)	It should be disinfected at least twice a day.
Lunch and resting rooms	Standard Bleach-Sodium hypochlorite (1:100 dilution) or Accelerated Hydrogen Peroxide 0.5%	Surfaces of tables, chairs, stands etc. should be cleaned according to the frequency of use. Rooms should never use more than the capacity, should be ventilated well.
Common use areas Door handles, queuing machines, electric buttons etc.	Standard Bleach-Sodium hypochlorite (1:100 dilution)	It is important to clean frequently all surfaces with contact risk.

In studies with N95 masks for re-use of personal protective equipment, ultraviolet (UV) rays have been found to reduce the amount of bacteria on N95 masks. Although similar results have been obtained for coronaviruses, comparative studies have not been conducted for SARS-CoV-2 yet.[50]

It is determined as an effective method for disinfection of N95 mask by hanging it with a plastic clip without touching the metal surfaces in the oven for 30 minutes at 70 ° C. There are more than one suggestion for steam disinfection. It has been emphasized that exposure of boiling water to steam for 10 minutes or 125 ° C steam for 3 minutes is effective methods for N95 mask disinfection.[50,51]

The filtration surfaces of N95 masks are made of a hydrophobic plastic material and can dry in about 2-3 days in dry environment. For this reason, four N95 masks can be can be used in order by numbering (3 days to dry 1 day use).[50] Goggles, face shields, apron and N95 masks are re-usable equipment. Detailed information on cleaning them is given in Table 3.

Table 3. Disinfection recommendations for reusable personal protective equipment

Personal Protective Equipment	**Disinfection methods**
Aprons	60-90°C, with detergent
N95 masks	1) Boiling water vapor (10 minutes) 2) At oven 70 ° C (30 minutes) 3) UV application * (254 nm, 8W, 30 minutes) 4) It can be used alternately for 1 day use and drying outdoors for 3 days.
Goggles / face shields	They should be cleaned according to the manufacturer's recommendation. If there is no recommendation, it should be disinfected with 70% ethyl alcohol and allowed to dry.
** It is effective on coronaviruses but its effect on SARS-CoV-2 is unknown.*	

Healthcare Workers

Healthcare workers are the riskiest group for COVID-19 infection. According to the Turkish Medical Association report, COVID-19 infection is considered as a work accident in healthcare workers. So, incidents related to COVID-19 should be reported as work accidents. For example, when a health professional or a person working in health services (safety, attendant, driver, secretary, etc.) has a splash or contamination of the patient's cough,

sneeze and other body fluids in the respiratory tract, or open wounds, it is necessary to report this as a work accident. Although there is no clear evidence of a sudden incident, if a health worker or healthcare professional is diagnosed with COVID-19, a notification of occupational disease should be made, taking into account the close link of the disease to the work done. Covid-19 diagnosis is a work accident or occupational disease.[52]

It is shown below Table 4 the personnel protective equipment(PPE) of healthcare workers for situations to be encountered.[20,53]

The order in which PPE is worn and removed is very important in terms of contamination. It is shown in the Figure 5.[54]

Table 4. Personnel protective equipment for different conditions at family health center

	Medical mask	N95 mask	Goggles or Face shield	Gloves	Apron
TRIAGE - Family physician or medical staff	✓		✓	✓	✓
EXAMINATION AND OTHER PROCEDURES AT COVID-19 AREA - Family physician		✓	✓	✓	✓
LOW RISK PATIENT EXAMINATION - Family physician *	✓			✓	✓
ALL MEDICAL INTERVENTIONS WITH CLOSE CONTACT - Family physician** or medical staff**	✓			✓	✓
DURING OTHER WORKS					
Cleaning staff***	✓			✓	✓
Medical secretary	✓				

* In the case of an oropharynx examination, eyeglass or face protection may be appropriate.
** Glasses or face shield should be used under conditions where droplets may occur.
*** Glasses or face shield should also be used in conditions where organic chemicals may splash. Closed shoes should be preferred.

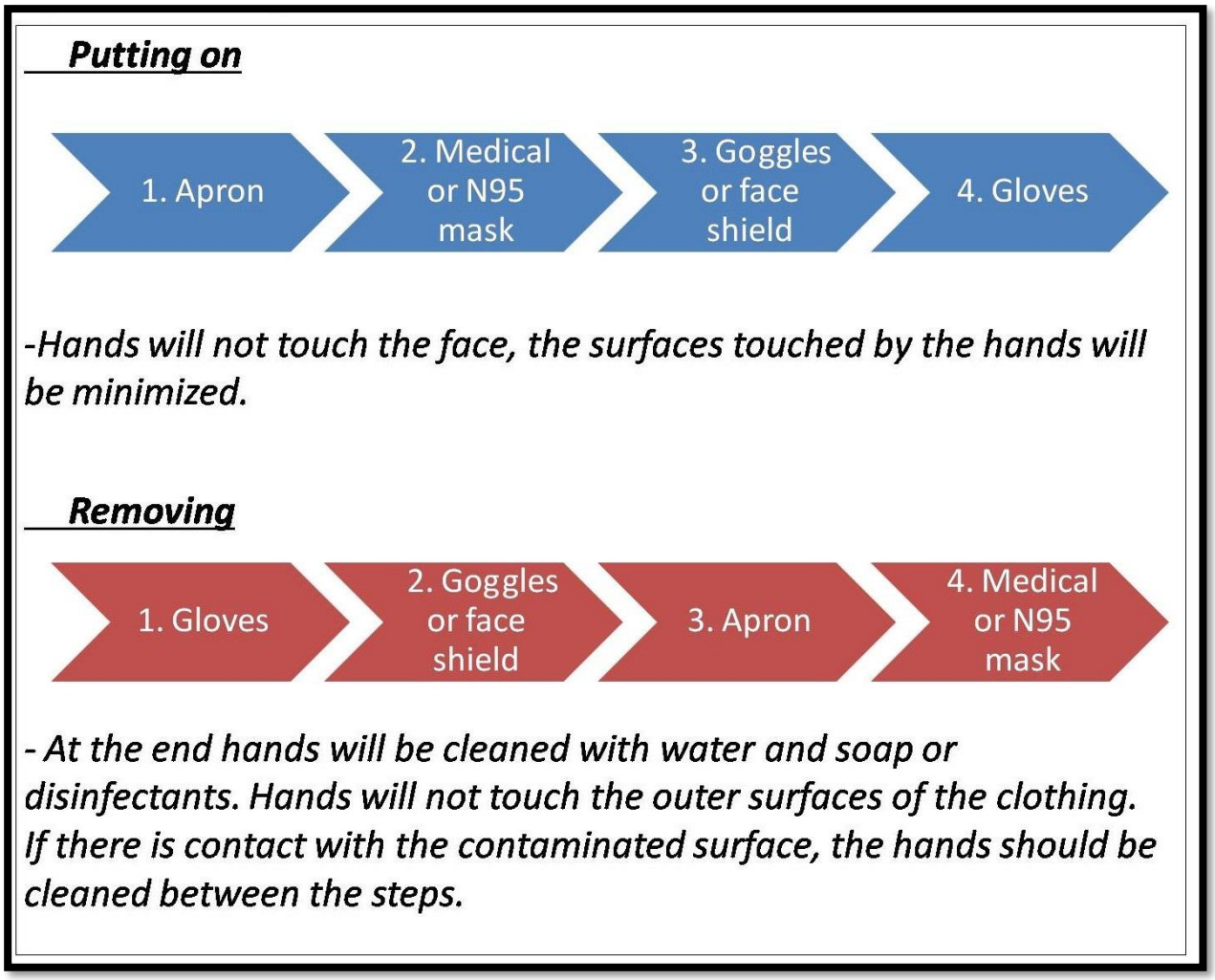

Figure 5. The order of putting on and removing personal protective equipment

Investigating the Field, Filiation

Field investigation or named as filiation studies is to work on determining the source and factor and take protection and control measures, to safely isolate and follow the transmission.[55] In our country healthy individuals, or suspected ones and diagnosed patients are all evaluated in detail. After the possible or definitive case is detected in the hospital, the case is processed in the Public Health Management System. The District Health Directorate's field team gets in contact with the patient and case is evaluated. From close relatives or households or co-workers of the patient samples of nasopharyngeal swabs are taken if they have any suspicious symptoms or sign. Chloroquine treatment is given to the individuals who are positive, and those who have mild disease. They are encouraged to comply with the isolation rules and their information is shared to their own family practitioner to be followed up properly. The cases are contacted and informed by family physicians over

the phone for 14 days daily. Patients whose symptoms are gradually increasing are referred to the 2nd or 3rd level health institutions accompanied by 112 Emergency Service, thus ensuring that people who are sick are treated early.[20] These all investigation studies aim to reduce hospitalizations and deaths due to COVID-19 infectious disease.

Approach to the Patient in Isolation

During the pandemic, each individual is already asked to isolate himself even without any sign or suspect of infection. Besides, patients diagnosed with COVID-19 or patients who are considered to be at high risk as a result of examinations, tests and imaging, but do not need inpatient treatment should be quarantined at home. These individuals also need to isolate themselves from individuals around the work or home. Individuals contacted with a patient diagnosed with COVID-19 and individuals who have someone diagnosed with COVID-19 at home, are also isolated. After the field investigation and filiation studies completed, patients or high risk individuals are phone called by family physicians and their clinical status is monitored continuously for at least 14 days.[20]

When the patient is called, physicians ask about patient's general clinical situation and how he feels compared to yesterday. In particular, cough, shortness of breath and fever are important symptoms to be followed. All these findings and the day of contact are noted on the family medicine information software. When any of the symptoms of cough, fever and shortness of breath develop, the patient should be directed to the emergency room with the mask on. In addition to three major complaints, it is necessary to evaluate other upper respiratory tract infection symptoms or any other suspicious complaints and refer patient to district health directorates, COVID-19 pandemic hospitals or other planned healthcare centers. However, this referral conditions may change with the availability of facilities, occupancy rates of inpatient clinics and the state of the pandemic in the region.[20,56]

Patients can be followed up by communicating with the patient remotely, through the health equipment they have at home. They can be explained how to use the thermometer or the sphygmomanometer if available. Counting the number of breaths can be explained. Although it is not yet valid and validated in our country, at that difficult times, telemedicine applications, video conversations with the patient, monitoring of some vital signs with smart devices can be brought to the agenda. Other complaints of patients can be met in these ways. In addition, family physicians by informing to its entire population, can enable individuals with cough, fever and shortness of breath to contact with the phone before coming to the family health center and so they can be referred directly.[57]

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