

**Mini-Review****Situation of Coronavirus in Pakistan Regarding Diagnosis, Lab Facilities, Medical Equipment and Isolation Wards in Hospitals**

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Towards the end of 2019 a novel virus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), responsible for acute respiratory syndrome emerged from the city of Wuhan, China globally. World Health Organization declared in March 2020 that the SARS-CoV-2 virus is a global pandemic issue. Coronavirus spread from an infected person to others through droplets released during coughing and sneezing and through zoonotic sources, which are still under investigation. The government of Pakistan has announced the Nation Action Plan (NAP) to combat the corona virus pandemic. Implementation of preventive measures in hospitals to minimize the spread of disease. Coronavirus needs biosafety level II conditions and Real-Time Polymerase Chain Reaction (RT-PCR) which is accountable as the valuable diagnostic tool and the various lab assays for SARS-CoV-2 confirmation are required. Moreover, basic preventive measurements including hand washing, use of face masks, keeping the social distance from suspected patients, and avoiding unnecessary traveling to overcrowded areas, and quarantine of 14 days for infected persons. The disinfectants used are Sodium hypochlorite solution (bleach) and ethanol and proper discarding protocols for the contaminated materials. People with obvious symptoms of COVID-19 couldn't be tested. The security of these centers is also not strictly managed. People continued to escape from there and wander in local areas and markets and put the lives of healthy people in danger. The developing countries including Pakistan are at high risk. Personal and community-based strategy and public awareness are required to face any serious consequences in Pakistan from this pandemic disaster. In this review particularly, we are focusing on the corona virus diagnosis, hospital management, and its comparison with the developed countries.

INTRODUCTION :

Coronavirus disease is the disease which is caused by Coronavirus. SARS (Severe Acute Respiratory Syndrome) and MERS (Middle East Respiratory Syndrome) disease are also caused by viruses of this family. The most recent disease caused by this virus is COVID-19 where CO stands for corona, VI stands for virus, D stands for disease and 19 for year 2019 in which this disease first appeared. This name has been assigned on Feb 11, 2020 by World Health Organization (WHO) [1]. The virus is named as SARS-CoV-2. This disease affects the respiratory system so symptoms shown by the

patients include cough, fever and tiredness. Aches, pains, nasal congestion, runny nose, sore throat or diarrhea are also observed in some cases. Old age people and those persons who have some medical issues like diabetes, hypertension etc. are more likely to catch the disease [2]. Corona virus spread from infected person to others through droplets released during coughing and sneezing. Virus may spread when a person touches a surface on which virus is present and then touches eyes, nose or mouth. WHO is working tirelessly to overcome this pandemic by providing

advice, financial assistance, and medical equipment to countries, all around the world [4].

Situational Update of World as of 3rd April, 2020

Up till 3rd April, 2020, reported cases of Coronavirus are 1,162,297 all around the world. Total deaths caused are 62,444 and people recovered are 241,742. USA is at the top of list with total infections of 293,494. Deaths in USA are 7,896 and people recovered are 14,436. Total infections reported in Spain are 124,736 with 11,744 deaths and 34,219 people have recovered. Italy is on third having total infections 124,632 with 15,362 deaths and 20,996 people recovered [4].

Recent Situation of Pakistan

Till 3rd April, 2020; Pakistan had 2,640 confirmed patients of COVID-19: 783 patients belonged to Sindh, 1,069 from Punjab, 343 from Khyber Pakhtunkhwa, 175 from Baluchistan, 68 belonged to Islamabad and AJK has 9 confirmed patients of coronavirus. Till now 40 deaths have occurred of which 11 are in KPK, 14 in Sindh, 1 in Baluchistan, 3 in Gilgit Baltistan and 11 in Punjab [5]

Reasons for Outbreak of COVID-19 in Pakistan

Two of the neighbors of Pakistan are highly affected by corona virus. One is China which is the place where the disease first appeared and other is Iran where exponential increase in corona virus cases has been observed. This increased the risk of spread of disease in Pakistan due to travelling through both land and air routes. Pakistan is linked for trade with China whereas people go to Iran to visit the religious places present there. When these people returned, they import the virus along with them. This led to the need for regulating the travelling to and from these two countries [6]. At present, Pakistan is at a higher risk for the spread of Corona virus and needs strict measures to be taken in this regard [6].

Risk of COVID-19 in Pakistan

The risk of any pandemic is associated with country's economic conditions and health facilities. Pakistan is a developing country, so its infrastructure is not strong enough to combat with pandemics. All the initial cases of COVID-19 are hailing from Iran. The more threatening condition for developing countries like Pakistan is the global spread of the disease [6].

Efforts of Pakistan for Controlling COVID-19

The government of Pakistan has announced the Nation Action Plan (NAP) to combat the corona virus pandemic. This plan covers all the guiding principles for controlling and combating the corona virus pandemic [6]. The major aspects of this plan are:

a. The vision of National Action Plan (NAP) is the combine effort of whole nation to fight this disease and ensure minimal morbidity and mortality to decrease burden on country economy. The objectives of the plan include: to prevent the spread of the disease efficiently and timely, to

ensure best preparedness for the disease outbreak at local and national levels, to ensure financial assistance to the authorities and institutions that is at front line to COVID-19 [6].

b. The plan also includes strategic determinants which are as follow: to establish new mechanisms and strengthen the existing ones to ensure coordination between various departments and provinces, to assess the resources needed to fight the pandemic and those that we already have, implementation of health measures and preventive measures to minimize the spread of disease [6].

Situation of Pakistan regarding Hospitals

The Government of Pakistan is taking rapid measures to overcome the COVID-19 pandemic. These measures are the need of hour to prevent massive spread of the disease. In all the provinces, hospitals have been identified where COVID-19 patients and those who are suspected to be carrier of disease are admitted and treated in isolation from other patients. For this purpose, isolation wards have been established where all the medical facilities are provided to the patients [7]. Number of designated hospitals are shown in Table 1.

Waste Management at Hospitals

Procedures have been identified for disposal and management of waste materials of Corona virus. It needs to be carefully regulated as these materials can cause spread of disease. The contaminated materials are first autoclaved and then incineration is performed to decontaminate the materials [6]. The disinfectants used are Sodium hypochlorite solution (bleach) and ethanol [6].

Diagnostic Facilities in Pakistan

Laboratories all around the country have been instructed to take samples from the suspected persons while keeping in view all the biosafety and precautionary measures [6]. The Novel Corona virus requires biosafety level II conditions. The major laboratories of the country are in Table 2.

Quarantine Facility

The separation of such persons who have been exposed to the virus and restraining their activities is called quarantine whereas isolation is the separation of patients from healthy people. For this purpose, quarantine centers are established throughout the country [6]. The district management has been given the responsibility of administration, rations, and demarcations etc. of quarantine centers [6]. Following conditions should be kept in mind while establishing the centers: Separate places should be maintained for males and females, the quarantine centers should be away from residential areas but should be such that hospitals can be accessed easily, 14 days quarantine is necessary for those who have contacted the disease, appropriate food and other necessary facilities should be provided to the people at centers, the staff should be provided with personal

protective equipment and proper training [6]. Some of the major quarantine centers in Pakistan are given in table 3.

Response of Pakistan Government

It was confirmed in February that corona virus pandemic has reached Pakistan. Currently Punjab province has the highest number of patients [8]. Most of the regions of country have announced the lockdown to control the pandemic. Pakistan International Airline(PIA) has suspended all the international and national flight operation due to the outbreak apart from those at Lahore, Karachi and Islamabad airports. Due to closure of flight hundreds of people are stranded in different countries. Screening procedures have been introduced at four (4) main airports: Lahore, Karachi and Islamabad and Peshawar for passenger incoming from China. The government has advised precautionary measures such as using masks, sanitizers avoid the public to mass gatherings, handshaking or hugging and take other [8].

It was decided in a meeting of Prime Minister with National Security Council that all universities and schools would be closed until 5th April, 2020. The Pakistan Day Parade was also cancelled. So, the nation celebrated the Pakistan Day without military parade. Pakistan closed its borders at the Chaman Border travelers from Afghanistan and the Durand Line Border. The Chaman border was later reopened for brief period for logistic transport. All land borders, including borders with China and Iran were shut from 16 March. Trains (42) had been suspended by Ministry of Railway. The federal government presented financial assistance to Sindh where the disease first broke out by allotting the funds of worth \$10 million [8].

The Prime Minister had stated that the total lockdown of country is impossible because most of our people live below the line of poverty. In this situation lockdown means to kill those people of hunger. The president and prime minister have urged the nation to show unity in this hour of need [8]. A "Corona Relief Tigers" youth force had been announced by the federal government. The youth of nation could become part of this program and the members had to spread awareness in public, avoid public gatherings, and make sure the fair distribution of ration among poor and needy [8].

Economic Relief Package

On 24th March, federal government announced an economic relief package of worth Rs 1.2 trillion. For low-income families, Rs 150 billion allotted and Rs 280 billion for wheat procurement. The Benazir Income Support Programmed monthly stipend is increased from Rs 2000 to Rs 3000. The petroleum prices has been significantly reduced. This package was approved by federal cabinet on 31st March [8].

No.	Province/ Region	Hospital
1.	Islamabad	Pakistan Institute for Medical Sciences (PIMS)
2.	Punjab	Benazir Bhutto Hospital, Rawalpindi Services Hospital, Lahore Nishtar Hospital, Multan
3.	Sindh	Civil Hospital, Karachi LUMS Hospital, Hyderabad
4.	Baluchistan	DHO Hospital, Gwadar Sheikh Zayed Hospital, Quetta DHO Teaching Hospital, Turbet
5.	Khyber Pakhtunkhwa	Khyber Teaching Hospital, Peshawar Bacha Khan Medical Complex, Swabi Lady Reading Hospital, Peshawar
6.	Gilgit-Baltistan	Civil Hospital, Hunza DHO hospital, Gilgit
7.	Azad Jammu & Kashmir	Abbas Institute of Medical Science, Muzaffarabad DHO Hospital Mirpur, AJK

Table 1: List of hospitals designated for Coronavirus

Sr. No	Province/ Region	Laboratories
1.	Islamabad	National Institute of Health (NIH)
2.	Punjab	Armed Forces Institute of Pathology (AFIP), Rawalpindi ShaukatKhanum Hospital, Lahore Nishtar Hospital, Multan
3.	Sindh	Agha Khan University Hospital, Karachi Civil Hospital, Karachi Indus Hospital, Karachi
4.	Baluchistan	Public Health Lab, Fatima Jinnah General & Chest/TB Hospital, Quetta
5.	Khyber Pakhtunkhwa	Public Health Lab, Khyber Medical University, Peshawar
6.	Gilgit-Baltistan	District Headquarter Hospital, Gilgit
7.	Azad Jammu & Kashmir	Abbas Institute of Medical Science, Muzaffarabad
8.	NIH Mobile Testing Lab	Deployed at Taftan where Pakistan shares border with Iran

Table 2: List of Laboratories designated for Coronavirus

Sr. No	Province/Region	Centers
1.	Islamabad	Hajji camp PakChina Friendship Centre
2.	Baluchistan	Turkish Colony, District Jaffar Abad Midwifery School, District Naseer Abad DHO Hospital Kachi Boys Highschool Gandawah, District JhalMagsi Boys Highschool Digri, District Sohbatpur Sheikh Khalif Bin Zayed Hotel, District Quetta
3.	Khyber Pakhtunkhwa	LandiKotal, District Khyber Darazinda, District Dera Ismail Khan Peshawar Gomal Medical College, District Dera Ismail Khan
4.	Sindh	Sukkur Labour Colony Karachi Doaba Hospital
5.	Punjab	Ghazi University, District Dera Ghazi Khan Islamia University, District Bahawalpur Lahore Sialkot Multan Faisalabad
6.	Gilgit-Baltistan	Combined Military Hospital (CMH) Skardu Muhammadabad Civil Hospital, Gilgit Ice Cap Hotel, Gilgit Capitalodge Hotel, Gilgit Dreamworld Hotel, Gilgit
7.	Azad Jammu & Kashmir	College of Medical Technology (CMT) Hostel, Mirpur Chinese Camp at Khunbanway, Muzaffarabad Block D at District Complex, Rawalakot (Poonch)

Table 3: List of quarantine Centers designated for Coronavirus

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