CASE SERIES

Is Transmissibility of Novel Covid-19 Different in a Developing Country Like Pakistan? A Case Series Highlighting Family Cluster Spread of the First Covid-19 Patients

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ABSTRACT

Covid-19 is a huge global public health crisis. The world has not seen such an extensive health emergency for the last hundred years. We report the detailed symptomology, epidemiology, and demography of the first few cases reported in Pakistan. After review of medical records at a private hospital in Karachi, six patients (four men and two women) are included in the present case series. A twenty-six years old male, the first patient diagnosed in Karachi, on February 26th, 2020, had travelled from Iran. He developed fever and respiratory symptoms but was discharged after making a complete recovery. The next group of pilgrims tested positive on March 8th, 2020. One male among them, with a pre-existing medical condition, expired after three weeks. Rest of the patients made complete recovery. Our findings suggest that Pakistan might have a different strain of Covid-19 compared to the strains found elsewhere.

Key Words: Case series, Covid-19, Pakistan

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BACKGROUND

Epidemic of unknown acute respiratory tract infection broke out first in Wuhan, China in December 2019, subsequently declared a pandemic by the World Health Organization on March 11th, 2020. Several studies have suggested that bat may be the potential reservoir[1,2]. The protein sequence analysis shows similar residues of receptors in many species, like pangolins, snakes, turtles[2,3].

WHO has widely highlighted human to human contact.Viruses have many types, e.g. HPV has more than 100 strains, out of these 5 or 6 most virulent ones, cause cervical or genital tract cancer, the rest may be benign and silent. There are different genera of corona virus—alpha, beta, gamma, delta. This paper looks at the possibility of such mutation that some strains will behave differently in different circumstances.Some Corona Viruses (CoVs) are mild and others may lead to potentially fatal respiratory tract infections[4]. This paper compares family cluster spread in Pakistan and China and looks at the symptomology, demography, and epidemiology of initial patients in Pakistan.

INTRODUCTION

Witnessing a pandemic is the first experience for the three to four generations occupying the globe currently. The outbreak of 2019 novel coronavirus disease (Covid-19) was first reported on December 31, 2019, in Wuhan, China[3]. Within a few weeks, the virus had spread rapidly throughout China and to several other countries in a month, including Italy, the United States, and Germany[4,5].

Consequently, more than half of the globe was either in lockdown or in a state of curfew. Covid-19 was declared a pandemic on March 11, 2020 by the World Health Organization (WHO). Globally, the cases have caused more than 100,000 mortalities, mainly in the USA, the UK, Italy, Spain, China, and Iran. Not only is it causing health concerns (pneumonia), but social, psychological, and economic issues are impacting the very essence of humanity.

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The ways for human-to-human transmission and pathogenic means of the SARS-CoV-2 are under the microscope globally. Built around the present epidemiological evidence, the incubation period is 1-14 days and Covid-19 is infectious during the latency period[6]. It is highly transmissible in humans, especially in the elderly and people with underlying diseases. Recent evidence from the United States and the UK has shown it in younger population also. The median age of patients is 47-59 years, and less than 40 % of the patients were females[7]. The most prominent symptoms are fever, malaise, and cough[4]. Some patients rapidly progress to critical condition and develop acute respiratory distress syndrome, respiratory failure, multiple organ failure, even deaths[8].

Epidemiology in Pakistan

Pakistan and other underdeveloped countries have seen low transmission up till now. The reasons for this are unknown. In order to understand the root cause, it is important to study the cases. This is an account of early cases in Pakistan.

Patients and Method

The first patient "X" diagnosed with Covid-19, had travelled to Iran. This patient was PCR positive with chest and flu-like symptoms. All the flight passengers were subsequently traced and tested and were found to be PCR negative. Close family cluster was also negative. The next cases were reported on March 8, 2020 in a group that had travelled to Iraq and Syria for religious pilgrimage. Amongst these, a couple was found to be positive—Patient A and his wife B. Patient A was a 68 year old male with underlying diabetes (HbA1c-9), had fever, and chest lesions where as the wife, 63 years old female, had only bodyache, and no fever or cough symptoms. This couple stayed for five days with their son's family (son, his wife and child) after coming back from the pilgrimage. All tested negative on PCR, but were still put in quarantine.

In this same group, the Patient A's brother—Patient C for this narrative—was positive with severe symptoms and required respiratory support. His wife, who was

Table 1: Characteristics of the First Patients of Covid-19 in Pakistan

	Patient X	Patient A	Patient B	Patient C	Patient D	Patient E	Attendant F	Attendant G
Age	26	68	62	54	50	48	47	48
Sex	Male	Male	Female	Male	Male	Female	Female	Female
Relationship	-----	Brother of C & D and husband of B	Wife of B	Brother of A & D and husband of F	Brother of A & C and husband of E	Wife of D	Wife of Patient C	Sister of A, C & D
Primary destination	Iran	Iraq/Syria	Iraq/Syria	Iraq/Syria	Iraq/Syria	Iraq/Syria	Iraq/Syria	Iraq/Syria
Suspected source of exposure	Mass religious pilgrimage	Mass religious pilgrimage	Mass religious pilgrimage	Mass religious pilgrimage	Mass religious pilgrimage	Mass religious pilgrimage	Mass religious pilgrimage	Mass religious pilgrimage
Medical disorders	-----	Diabetes	----	Pre-diabetes	----	----	----	----
Exposure status	Full flight of passengers and family cluster	Full flight of passengers and close family cluster	Full flight of passengers and close family cluster	Full flight of passengers and close family in contact for 5 days alongwith unprotected medical personal	Full flight of passengers and close family cluster	Full flight of passengers and close family cluster	Wife who was on the trip but had negative results	Sister who was on the trip but had negative results
PCR test results	Positive	Positive	Positive	Positive	Positive	Positive	Negative	Negative
Interval between symptoms and diagnosis	5 days	8 days	8 days	8 days	8 days	8 days	-----	-----
Temp ^{O}C	38.5	39	37	39	38	37	-----	-----
Symptoms	Fever, cough	Fever, respiratory congestion	Body aches	Fever, chest pain	Fever, cough	Myalgia	Mild flu like symptoms	Mild flu like symptoms
Days of admission	20 days	15 days	15 days	Expired in 3 weeks	18 days	18 days	-----	-----
Treatment received	COVID protocol	COVID protocol along with treatment for other morbidity	COVID protocol	COVID protocol along with treatment for other morbidity	COVID protocol	COVID protocol	-----	-----

also with this group in the pilgrimage, was in contact with husband and other group/family members throughout but she tested negative. The Patient C, a 54 years old male with pre-diabetes, was admitted in a private hospital for a few days. In this cluster, Patient C unfortunately expired after three weeks of intensive treatment. The disease not only took a toll on his lungs but other systems like kidneys also failed and he expired of sepsis and multi organ failure.Many healthcare providers were exposed to this patient before the test was undertaken. All these personnel tested PCR negative.

As of today, all of these cases have recovered and have been discharged with one expiry (Table 1).

DISCUSSION

It is now well known that all the initial patients in Pakistan were travelers and pilgrims. This is seen in literature where initial patients had travelled from Wuhan or China[9].

We report here a familial cluster of Covid-19. These include five out of seven family members with PCR positive results and the first diagnosed case in Pakistan. Total members in this cluster of pilgrims were eight, which included four females and four males. Out of these two females, Attendant F and Attendant G were Covid negative, where as other two females had mild symptoms and were also admitted in hospital as shown in Table 1.

Three males had symptoms of fever, cough, and respiratory deterioration. The males of this group had comparatively more symptoms. All females had mild symptoms with two PCR negative results and two PCR positive results. Global Health 2050 tracks sex-disaggregated infection and mortality Covid-19 data from the 39 most-affected countries. Some countries, including the UK, the USA, Russia, and Brazil, have yet to report such data. From those that have, it is unclear whether women or men are more likely to become infected, but more men are dying from Covid-19[10].

Adverse outcomes of Covid-19 seem to be associated with comorbidities, including hypertension, cardiovascular disease, and lung disease. The over all Pakistani data, especially in Sindh, also shows that fewer females (30%) are affected as compared to males (70%). Moreover, females had milder symptoms in our study group as well, they showed no lung lesions, and their recovery was more rapid. There was no mortality in women in this group.

In this cluster, Patient C, brother of Patient A, and D had the most severe symptoms. He reported with high grade fever and respiratory deterioration. Patient A had fever and some oxygen desaturation, with oxygen levels as low as 87% and he required only oxygen support. Oxygen is the mainstay of treatment with proven efficacy and is shown as such in Literature[11].

The Patients A and B had stayed with their son's family for five days after returning from the pilgrimage. The son and his family were all PCR negative. This has not shown up till now in any evidence. Contemporary research shows that the close contacts may be non-symptomatic but still are positive[12].

The disease was seen in the most aggressive pattern in one patient C, but again highlighting the strange nature or yet to be explained contagious pattern of the disease, the wife and children of patient C stayed negative despite being in close contact until patient C developed respiratory symptoms. Also, even though he went to different hospitals with fever and chest congestion initially, all the medical personnel he came in contact with, including doctors and nurses (not in Personal Protective Equipment at that time), tested negative. This has not been seen internationally[13].

The purpose of highlighting this different nature of transmissibility is that as it is a novel virus, there are many gaps and evidence is currently inconsistent. There are many questions and few most important ones are related to transmissibility. Many scientists are surprised that South Asia has not yet seen the kind of growth in cases that is there in the USA, the UK, Spain, and Italy. This article was written in March 2021.

There are multiple possible answers. The many theories which are focusing on the lower transmissibility of Covid-19 are:

1. Our governments may have acted early on the WHO advice of Non pharmaceutical interventions (NPI) like lockdown and social distancing (although there are incidents of gross violation in Pakistan).

2. This virus may have many types and mutations. It is exhibiting different behaviours as per its genera, alpha, beta, delta and gamma. The various CoVs of animal origin undergo evolution and genetic recombination. Some of these may be less virulent than others. Its constant mutations will keep challenging scientists. CoVs that may be highly pathogenic and potentially more deadly to humans take time to mutate, therefore the first few weeks are slow.

3. As we are in an endemic region for Malaria, mostly the population has had malaria and taken chloroquine that may be causing some protection[14].

4. Tuberculosis vaccine may have some antibodies to protect against Covid-19[15].

5. Flu is more common due to pollution. Seasonal flu occurs five or six times in our part of the world and may have some role in reducing transmission for Covid-19.

6. Climate-specific cultural differences (living more outdoors than indoors), the effect of UV light on the survival of the virus on surfaces, immunological differences of the population (innate immunity), pre-exposure to coronaviruses, or the higher temperatures could all have contributed. To date, all identified cases of Covid-19 in Africa originated from Europe and not from China[16].

Strengths of the study: To our knowledge, this is the first case series looking at transmissibility of Covid-19 in Pakistan. It looks in detail on the presentations, comorbidities, course of illness, and low transmissibility of the virus in the initial cohort of patients.

Limitations of the study: It is a small study, covering limited patients and time. It may not reflect the entire epidemiology in Sindh or Pakistan. Additionally, since the study was conducted in the very initial months of the pandemic, the information on this pandemic has changed or is still evolving e.g. symptoms, mode of transmission, treatment, or management of cases.

CONCLUSION

The findings of this report show that the virus in Pakistan does not express the transmissibility that it had shown in China or in the Western World. The probability that Covid-19 may have a variety of strains, some not that lethal can be considered in the context of Pakistan and possibly other developing countries.

Authors' contribution: Nighat S Comephasized the study, FM helped in collecting Information, ZA wrote the first draft of the article, Nusrat S, Supervised and critically revised manuscript, MS helped in Liturer Searching and wrote the introduction.

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