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COVID-19 pandemic and its prevalence in northern areas of Pakistan

Asad Khan

Al-Shifa School of Public Health, Quaid-e-Azam University, Islamabad, Pakistan

Ashfaq Ahmad

Baqai Institute of Hematology, Baqai Medical University, Karachi, Pakistan

Muhammad Zeeshan

Department of Biochemistry, University of Malakand, Lower Dir, Pakistan

Abid Rahman

Department of Health Sciences, Riphah International University, Islamabad, Pakistan

Abid Ali

Centre for Omic Sciences, Islamia University, Peshawar, Pakistan

Sohaib

Nation College of Sciences (NCS), Khyber Medical University, Peshawar, Pakistan

Nasar Khan

Royal College of Nursing, Khyber Medical University, Peshawar, Pakistan

Asad Ullah

Nation College of Sciences (NCS), Khyber Medical University, Peshawar, Pakistan

Farzand Ali

Faculty of Management Sciences, Riphah International University, Islamabad, Pakistan

Ikram Ullah

Department of Medical Laboratory Technology, University of Haripur, Haripur, Pakistan

Wasim Muhammad

Institute of Paramedical Sciences, Khyber Medical University, Peshawar, Pakistan
Corresponding author email: wasimkmu@gmail.com

Abstract---Objectives: This study aimed to find the prevalence of COVID-19 in Northern Areas of Pakistan. This research will help researchers better understand the outbreak's tendencies and provide an estimate of the region's epidemiological stage. Material & Methods: This Cross-sectional retrospective study was conducted at Anwar Hospital, Anwar Clinical Laboratory, Saidu Sharif Swat (KP) Pakistan. Samples of all suspected COVID-19 patients who come for COVID-19 screening were included from March 2020 to 18 September 2021. COVID-19 screening was done using Polymerase Chain Reaction (PCR). Results: A sample of 2537 suspected COVID-19 patients were screened in this study. A total of 970 cases were positive and 1567 were negative by PCR. The prevalence of COVID-19 was 38.23%. All participants ages ranged from 9 to 70 years. Conclusion: As indicated by this study the prevalence of COVID-19 is high due to lack of awareness regarding SARS-CoV-2 infection transmission among the general population of Malakand division. Lack of SOPs compliance is the second reason for the high prevalence of COVID-19. A systematic monitoring program should be implemented to track the virus's adaptability, pathogenicity, transmissibility, and evolution. In the interim, while scientists search for a COVID-19 vaccine, the government in the region has taken the necessary steps.

Keywords---COVID-19, SARS Cov-2, prevalence, SOPs, Malakand, PCR.

Introduction

Coronavirus disease (COVID-19) is an infectious disease caused by SARS-CoV-2. Its name "Corona" comes from the virus's numerous crown-like spikes on its surface. SARS-CoV-2 is the member of β -coronavirus cluster. After SARS and MERS, COVID-19 is the third known zoonotic coronavirus [2]. It is a club-shaped glycoprotein covering, a pleomorphic or spherical shape, and a single-stranded RNA-enveloped virus. Coronaviruses have variants like alpha, beta, gamma, and delta. There are numerous serotypes of coronaviruses in each subtype. Some of them had an impact on humans and other animals such as dogs, mice, cats, pigs, and birds [8], [9].

Signs and symptoms

According to CDC you may have coronavirus if you have these signs and symptoms: loss of taste or smell, shortness of breath or difficulty in breathing, headaches, muscle or body pain, tiredness, cough, fever, or chills. Vomiting or nausea, diarrhea, runny nose or congestion, and sore throat are all symptoms of the flu. Additional signs and symptoms can also occur [8]. Symptoms might emerge anywhere between 2 and 14 days after being exposed to the virus. Children experience identical symptoms as adults, however, they are frequently milder. COVID-19 is more likely to cause major complications in older adults and people with serious underlying medical disorders including diabetes, and lung or heart disease [13].

Where do coronaviruses come from?

Camels, cats, and bats are known to transmit SARS-CoV-2 infection. The virus lives in the animals' bodies however don't infect them. Infections can spread to other species. As the infections spread among various species, they might change (transform). The infection can ultimately go between animal species and infect individuals. On account of COVID-19, the infection is probably going to have been contracted at a food market in Wuhan, China, where live animals, fish, and meat were sold. Regardless of the way that specialists are uncertain how individuals become infected, they have proof that the infection can be communicated directly starting with one individual and then onto the next through intimate contact [14]. (Figure 1)

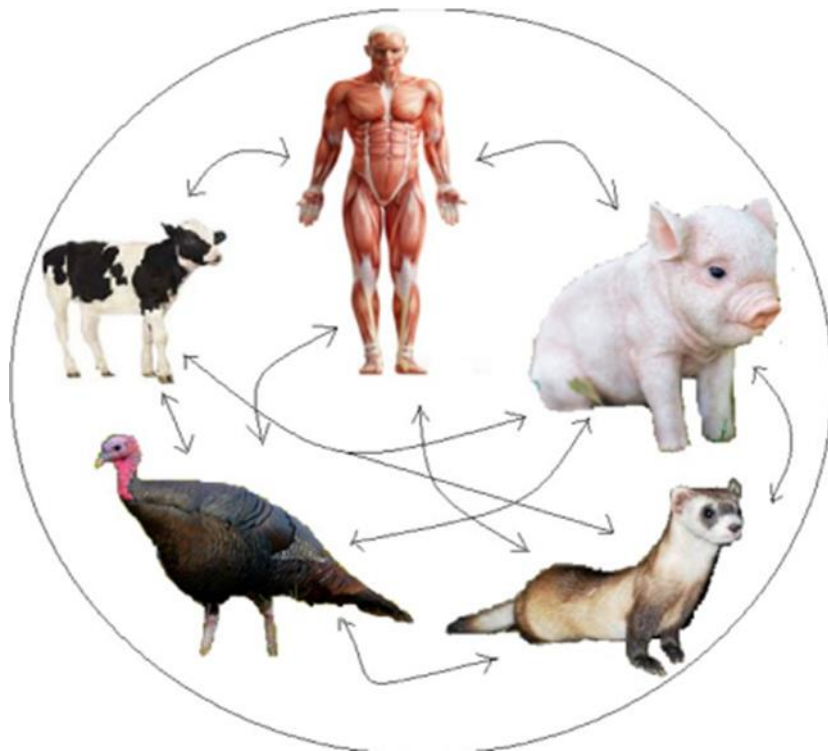


Figure 1: COVID-19 life cycle

Transmission

Since December 12, 2019, an outbreak of an unexplained acute respiratory tract illness has been reported in Wuhan, China, probably linked to a seafood market. Several studies have shown that bats could be a possible SARS-CoV-2 reservoir [16, 17]. However, there is no indication that SARS-CoV-2 originated in the seafood industry so far. On the other hand, bats are a natural reservoir for a wide range of Coronaviruses, including SARS- and MERS-like viruses [18,19,20]. The SARS-CoV-2 viral genome sequence was compared to Bat CoV RaTG13 and revealed 96.2 percent overall genome sequence identity, indicating that bat CoV and human SARS-CoV-2 may have shared an ancestor, even though bats are not

sold in this seafood market [21, 22]. Furthermore, protein sequence alignment and phylogeny analysis revealed that comparable receptor residues were found in various species, implying that alternate intermediate hosts, such as turtles, pangolins, and snakes, could exist [23].

SARS-CoV-2 is transmitted mostly amongst family members, and friends who have had close contact with patients or incubation carriers. According to reports, among non-residents of Wuhan, 31.3 percent of patients recently traveled to Wuhan and 72.3 percent of patients had contact with persons from Wuhan [24]. COVID-19 patients were infected by healthcare personnel in 3.8 percent of cases, according to a report released by China's National Health Commission on February 14, 2020. SARS-CoV and MERS-CoV, on the other hand, are thought to spread mostly in healthcare settings. SARS-CoV-2 infections among healthcare workers were found to be 33–42 percent, while transmission between patients was found to be 62–79 percent of MERS-CoV cases [25, 26]. The major route of SARS-CoV-2 transmission was thought to be direct interaction with intermediate host animals or ingestion of wild animals. SARS-source (s) and transmission routes are yet unknown. There was currently no indication of COVID-19 transmission from infected pregnant mothers to their fetuses via intrauterine vertical transmission. Infected mothers, on the other hand, may have a higher risk of respiratory problems [25].

COVID-19 Pandemic

The World Health Organization declared Coronavirus Disease 2019 (COVID)-19 to be an epidemic, and it was later proclaimed a pandemic on March 12, 2020, with Italy being the new “epicenter” of the emergency, which began in China Wuhan city. When the New Year begins on March 15, 2020, Italy will have 22,512 cases, with 2,026 (9 percent) of those working in hospitals [1, 11]. COVID-19's first wave shocked the planet and had an impact on numerous countries. The coronavirus was linked to the city's Huanan Seafood Market because of the virus's morphology and characteristics, which are zoonotic (infectious and caused by a pathogen transmitted from nonhuman to human transmission). As of February 18, 2020, the virus had caused 73,451 cases in 26 countries, with 1,875 deaths [3].

Spreading history of COVID-19

On December 31, 2019, the World Health Organization received notification of pneumonia cases with a dark start in China, East Asia's most populated country. A total of 44 pneumonia cases were discovered until January 3rd, 2020. On January 7, 2020, Chinese scientists announced that they have isolated a new virus known as 2019-nCoV from a Wuhan marine food market. All of the incidents were linked to Huanan's city Seafood Wholesale market, which offered a wide range of live animals like marmots, bats, and snakes [5].

One patient was transferred from Wuhan, China, according to Thailand's Ministry of Public Health on January 13, 2020. On 15 January 2020, the Ministry of Health, Japan reported the first case imported from Wuhan, China. Korea announced the first case of this virus in the country on January 20, 2020. In the

United States of America, the first case was confirmed on January 23, 2020. [6, 7].

Vietnam reported the first incidence of this virus infection in a person on January 24, 2020, who had never visited China. As a result, the coronavirus has been transmitted from one person to another for the first time. The government of Singapore reported the first case of COVID-19 on 24 January 2020. On January 25, 2020, the federal democratic republic of Nepal, the Australian government, and the French Republic confirmed its first case.

On the 26th of January 2020 (Malaysia), the 27th of January 2020 (Canada), the 28th of January 2020 (Sri Lanka, Germany, Cambodia), on January 29, 2020 (United Arab Emirates), the 30th of January 2020 (Finland, India, Philippines,), the 31st of January 2020 (Italy), the 1st of February 2020 (United Kingdom, Sweden, Spain Russian Federation), the 5th of February 2020 (Belgium) [4] [27] [28] [29].

Management and Vaccination

Currently vaccine available for this virus are Sinovac, BioNTech, Pfizer vaccine, CanSino vaccine, Moderna vaccine Oxford, AstraZeneca vaccine, Sinopharm BBIBP vaccine, Sputnik V vaccine. The science that has been present for decades was used to generate COVID-19 vaccines. Vaccines against COVID-19 are not being tested. They completed all of the required steps of the clinical trial. These vaccines have been thoroughly tested and monitored, and they have proven to be both safe and effective. They can keep you from getting COVID-19 and spreading it to others. COVID-19 vaccinations can stop you from becoming seriously ill even if you do catch a SARS-CoV-2 infection.

Health experts only use supportive therapy as a therapeutic technique. Antipyretic and analgesic medications, hydration assistance, mechanical ventilation for respiratory support, and antibiotics for bacterial infections are all examples of supportive care. According to several studies, ribavirin and interferon alpha have a synergetic impact in the early stages. Other investigations have found that mycophenolic acid can be used as a monotherapy [10,12]. In this study, we intended to explore the prevalence of COVID-19 in the Malakand division, which is arranged in rural and urban pieces of Khyber Pakhtunkhwa, Pakistan. Moreover, we wanted to discover some information about patients and the distribution of prevalence of this infection.

Methodology

Study Area, Study Design, and Study Population

The cross-sectional retrospective study was done at Anwar Hospital, Anwar Clinical Laboratory, Saidu Sharif Swat. All COVID-19-suspected patients of the Malakand division were included in this study from March 2020 to 18 September 2021.

Inclusion criteria/ Exclusion criteria

Suspected COVID-19 patients both male and female were included in this study.

Sample size, sampling technique, and Data collection

Samples of 2537 suspected COVID-19 patients were included. Samples were collected through the non-probability (convenient Sampling) technique. Secondary data were collected under the supervision of the Lab In-charge.

Data processing and analysis

A descriptive analysis was done to examine the prevalence of COVID-19 in the study population. All analyses were done using Microsoft Excel.

COVID-19 Screening (PCR)

Samples were taken in Viral Transport Medium. Biosafety Cabinet 2 plus was used for the processing of samples. COVID-19 screening was done by using Abbott m2000sp and Zinexts automation for RNA Extraction. For amplification, Abbott m2000 Real-Time System, Systaaq, Sacace Sa - cycler, and Cepheid were used.

Results

A sample of 2537 suspected COVID-19 patients were screened in this study. Among them, 970 cases were positive and 1567 were negative. The prevalence of COVID-19 was 38.23% (Table 1).

Table 1: Newly reported cases of COVID-19.

COVID-19 Total	COVID-19 Positive	COVID-19 Negative	Percentage %
2537	970	1567	38.23

Age-wise Prevalence of COVID-19

All participants' age ranges between 9 to 70 years were included in this study (Figure 2).

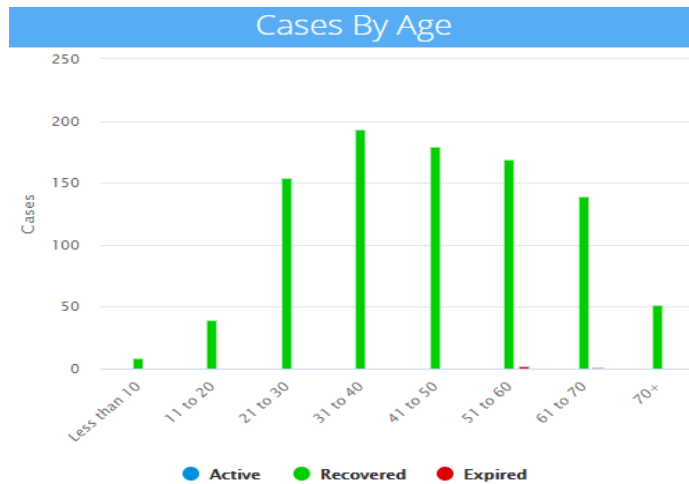


Figure 2: Reported cases of COVID-19 age-wise

Gender-wise Prevalence of COVID-19

In current 306 females and 664 males were found to have COVID-19. [30] Females are more resistant to infections than men, which could be due to a variety of factors such as sex hormones and high expression of coronavirus receptors (ACE 2) in men, as well as lifestyle factors including smoking and drinking at higher rates in men than in women. Furthermore, when it comes to the COVID-19 outbreak, women are more careful than men. This might have a reversible influence on the adoption of preventative measures like regular hand washing, face mask use, and stay-at-home orders (Figure 3).

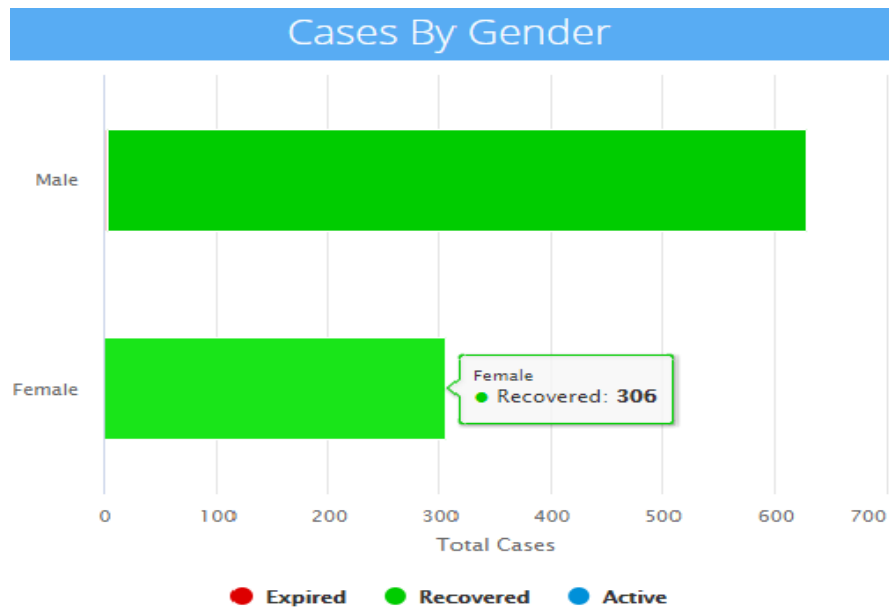


Figure 3: Reported cases of COVID-19 by gender

Symptoms of COVID-19

In the current study 31% of patients had a fever, 28.6% cough, 14.8% sore throat, 7.1% body ache, 3.8% diarrhea, 4.8% had loss of smell and taste and 4.3% patients had flu, headache, fatigue, runny nose, nausea or vomiting. (Figure 4).

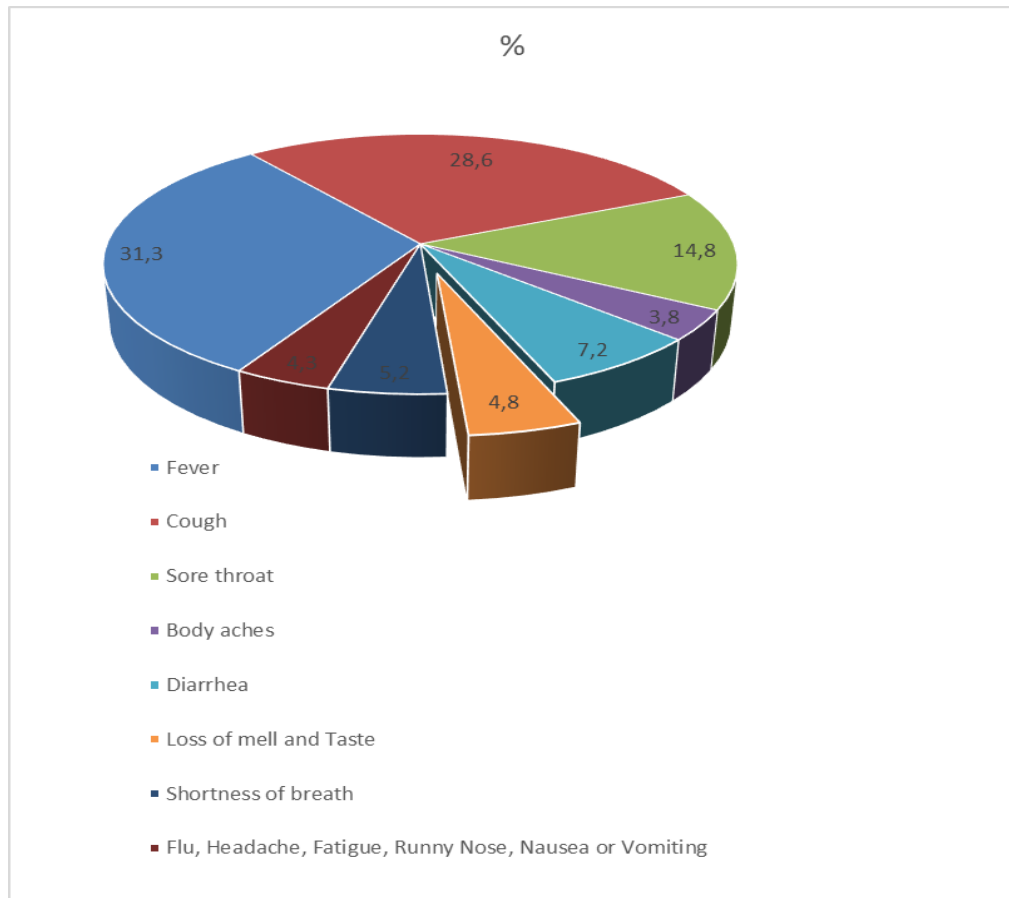


Figure 4: Frequency of COVID-19 symptoms

Discussion

In this study, we attempted to estimate the prevalence of this infection in northern areas of Pakistan. The major causes of the high prevalence of COVID-19 cases are unawareness about symptoms and transmission risk factors and lack of knowledge about routine check-ups. Delivering COVID-19 diagnostic, treatment, and vaccination while preserving essential health services needs a multidisciplinary healthcare workforce that is healthy, trained, competent, equipped, protected, and well-managed staff. COVID-19 causes dozens of new problems for volunteer health and social care workers, resulting in increased workload and time off. Prior labor force deficiencies, staff repurposing for the COVID-19 reaction, contaminations and mortalities, quarantine and self-isolation

necessities, stress and burnout, deficiencies of critical equipment and supplies like personal protective equipment (PPE), inadequate training, labor disputes; and caring for infected friends and family are just a few of the difficulties.

To accurately define the impact of COVID-19 on health and social care workers, a complete assessment should include standardized metrics and reporting. There are international indicators in place, and they are used in WHO's continuous surveillance and communications efforts. Health and social workers who come into touch with COVID-19 patients and/or care for COVID-19 patients are more likely to become infected than the general public. Mitigating and decreasing this risk, as well as adhering to WHO guidelines, is critical.

Conclusion

The epidemiologic behavior of COVID-19 infection introduced in the Pakistani population from neighboring countries has responded differently in community spread among different ethnic groups represented in different provinces of Pakistan. Sneezing, kissing, coughing, and smooching create airborne droplets that carry this virus. If you have a sick companion or family member, stay away from these activities. Pets such as turkeys, cows, pigs, and cats can spread this virus. If you observe any signs of infection, such as diarrhea, a cold, or a fever, avoid contact and isolate them. Avoid contact with sick people as much as possible, as well as in marketplaces and public areas, according to WHO and ECDC guidelines. Getting vaccinated can help protect individuals around you, especially those who are more vulnerable to COVID-19-related sickness. Every person must be vaccinated.

Conflict of Interests

The authors announce that they have no contending interests.

Ethical Approval

All investigations were performed as a part of routine medical care with no need for separate informed consent.

Funding/Support

This study has been done with on self-support. Not received any funding from any institution or organization.

Abbreviations

COVID-19: Corona Virus disease 2019

SARS: Severe acute respiratory syndrome

MERS: Middle East respiratory syndrome

SARS-CoV-2: Severe acute respiratory syndrome- Corona Virus-2

CoVs: Corona Viruses

SARS-CoV: Severe acute respiratory syndrome- Corona Virus

MERS-CoV: Middle East respiratory syndrome- Corona Virus

CoV: Corona Virus

WHO: World Health Organisation

ECDC: European Centre for Disease Prevention and Control

ACE 2: Angiotensin-Converting Enzyme

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