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Hospital Based Prevalence of SARS-CoV-2 and Clinico-Demographic Profile of COVID-19 Patients: A Study from a Tertiary Care Hospital of North India

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Authors' contributions

This work was carried out in collaboration among all authors. Author AF designed the study, while author SK performed the statistical analysis, wrote the protocol and managed the data. Authors RK managed the literature searches. Author UA analyzed and wrote the final manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Aims: To find out the prevalence, predominant risk factors and various clinico-demographic variables among patients infected with SARS-CoV-2 during the first year of the pandemic.
Study Design: Hospital based, cross sectional study.
Place and Duration of Study: Postgraduate department of Microbiology, Government Medical College, Srinagar, and associated hospitals, between March 2020 and March 2021.
Methodology: Individuals with acute respiratory infection (ILI and SARI), high risk contacts and asymptomatic close contacts of COVID-19 positive patients, hospitalized patients dated for

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surgeries, pregnant women near expected date of deliveries, travellers were screened. A confirmed case of Covid-19 was defined as a positive result on real-time RT-PCR assay of nasopharyngeal and or Oropharyngeal swab specimens. A total of 2,17,665 samples were collected and processed over a period of one year.

Results: Out of 2,17,665 samples, 61.3% were males and 38.7% were females, overall mean age was 34.3 years. 24,009 (11%) tested positive for SARS-CoV-2 infection, among them 63.5% were males while 36.5% were females, the mean age observed was 35.3 years. Highest positivity was observed in the age group of 30 – 39 years (22%), followed by 20 -29 years (20.4%), 12 (0.1%). Among positive cases, 19.4% had a history of contact with a lab confirmed case of SARS-CoV-2, 4.3% were HCW's and 2.6% were pregnant females. 929 (3.9%) patients who tested positive had presented with SARI. Fever was the most common symptom (62%), followed by cough (41%) and fatigue was reported by 37% patients. Comorbidities were present in 23.2% patients, of which Hypertension 10.8% was the most common, followed by COPD 4.9% and Diabetes mellitus 4%.

Conclusion: As evident from our study, COVID-19 has a high positivity (11%) in our region, with males twice more likely susceptible than females. High percentages (62%) of people were symptomatic at presentation, while severe disease was seen in only 3.9% patients. Early aggressive testing is essential to decrease the morbidity and mortality rates associated with COVID-19.

Keywords: SARS-CoV-2; COVID -19; real-time RT-PCR; comorbidities.

ABBREVIATIONS

ARI : Acute respiratory infection
ILI : Influenza like illness
SARI : Severe acute respiratory infection

1. INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an illness caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). On December 31, 2019, a cluster of pneumonia cases of unknown etiology in Wuhan, China, was first reported to the World Health Organization (WHO), China country office by the Wuhan Municipal Health Commission [1,2]. The unknown agent was identified as a new type of coronavirus (novel coronavirus, nCoV), which was isolated on January 7, 2020, now known as the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1,3].The World Health Organization declared a global pandemic on March 11, 2020 [4]. As of June 8th, 2021 over 173 million cases of COVID-19 have been reported globally with over 3.7 million deaths. 223 countries have reported cases with India reporting close to 20.9 million cases and 3.5 L deaths, second only to USA leading with 33.5 million cases and 5.98 L deaths [5]. The first positive case of COVID-19 was reported in the Kashmir division, J&K on the 18th of March, 2020. A 65 year old lady from Srinagar who had history of International travel tested positive two days after her return from Saudi Arabia. As of June 8th, 2021 the state of J&K has reported a total of 3,01,467 positive cases of SARS-CoV-2 infection (2,73,853 recovered & 4,090 deaths), out of which 1,86,290 cases are from the Kashmir division (1,69,387 recovered & 2102 deaths). [6].

Coronaviruses (CoVs) have been associated with notable disease outbreaks in East Asia and the Middle East over the past two decades. While severe acute respiratory syndrome (SARS) emerged in the winter 2002 in southern China, the Middle East respiratory syndrome (MERS) began to emerge in 2012 from Saudi Arabia. Now, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), causing coronavirus disease 2019 (COVID-19) has emerged and has led to worldwide health crises, causing an ongoing global pandemic [7]. Early indications were that the overall case-fatality rate is around 2%. An analysis of the first 425 cases provided an estimated mean incubation period of 5.2 days and a basic reproductive number (Ro) of 2.2 [8]. The overall mortality associated with COVID-19 is far less than for SARS or MERS [9]. Human to human transmission of COVID-19 occurs primarily via respiratory droplets, aerosols, direct contact and through surfaces contaminated with fomites [10,11]. Among other modes, faeco-oral, bloodborne, mother-to-child, and animal-to-human transmission have also been reported [12,13]. An average of 1000 infectious SARS-CoV-2 virions are thought to initiate a new infection, during human to human transmission [14].

SARS-CoV-2 RNA can be detected in people 1-3 days before their symptom onset, with the highest viral loads, as measured by RT-PCR, observed around the day of symptom onset, followed by a gradual decline over time [15]. The duration of RT-PCR positivity generally appears to be 1-2 weeks for asymptomatic persons, and up to 3 weeks or more for patients with mild to moderate disease [16]. In patients with severe COVID-19 disease, it can be much longer [15]. The clinical course of COVID-19 evolves in at least three phases: the first phase with cough, fever, wheezing, fatigue, headache, diarrhea, and dyspnea, consistent with upper tract respiratory infection (URTI). The second phase, with the rapid appearance of bilateral pneumonia, infiltrates with variable degrees of hypoxemia, and the third phase in which some patients developed respiratory failure leading to death [17]. Therefore, it's imperative to find effective ways to stop the transmission, diagnose the disease at the earliest and to isolate and treat all the infected individuals. This study, one of the first of its kind will give us an insight into the prevalence, clinico-demographic profile and associated risk factors among COVID-19 patients.

The aim of the present study was to find out the prevalence of SARS-CoV-2 infection, the predominant risk factors and clinico-demographic variables among patients testing positive for COVID-19.

2. MATERIALS AND METHODS

2.1 Study Design and Setting

This hospital based, cross sectional study was carried out in the Virology division of the Postgraduate department of Microbiology, Government Medical College, Srinagar, and associated hospitals, a tertiary care center that caters to the majority of population in the Kashmir division. All the relevant clinical, demographic, and epidemiological information was recorded over a period of one year from March 2020 to March 2021.

Individuals with acute respiratory infection (influenza-like illness and severe acute respiratory infection), high risk contacts and asymptomatic close contacts of COVID-19 positive patients, hospitalized patients dated for surgeries, pregnant women near expected date of deliveries, travellers who fulfilled the ICMR screening criteria (dated May 18, 2020) were screened [18]. All the patients that were tested for SARS-CoV-2 by RT-PCR were included in the study. A confirmed case of Covid-19 was defined as a positive result on real-time RT-PCR assay of nasopharyngeal and or Oropharyngeal swab specimens. A total of 2,17,665 samples from clinically suspected cases of COVID-19 were collected and processed at the VRDL division of our department over a period of one year.

2.2 Sample Collection

All the health care workers (HCW's) involved in sample collection and transport were trained appropriately and provided relevant SOP's. Before initiating sample collection, a full personal protective equipment (PPE) was worn. Proper specimen collection is the most important step in the lab diagnosis of COVID-19. Improper specimen collection may lead to false or inconclusive results. For initial diagnostic testing of SARS-CoV-2 infections, CDC recommends collecting and testing an upper respiratory specimen. Upper respiratory tract specimens, which include Nasopharyngeal (NP) swabs, oropharyngeal (OP) swabs, Nasal mid-turbinate (NMT) swabs, nasopharyngeal wash/aspirate, and saliva have all been used. Lower respiratory specimens like sputum, BAL, Tracheal aspirate, Lung biopsy and pleural fluid also remain an option [19]. NP swabs were taken from deep nostrils using a dry, synthetic swab. The swab was inserted into the nostril along the floor, parallel to the palate and back to nasopharynx. It was left in place for a few seconds and rotated three times. The swab was then slowly removed and the tip was placed in a vial containing 3ml of viral transport media (VTM), while breaking the applicator's stick and was subsequently transported to the COVID testing lab at 4^0C as quickly as possible.

2.3 Sample Processing

On receipt, the samples collected from different locations spread around the state were processed in the biosafety level III lab (BSL III), negative pressure room. A real-time RT-PCR assay in accordance with the manufacturer's instructions was used for the detection of ribonucleic acid (RNA) from SARS-CoV- 2 present in the NP swabs from patients suspected of COVID-19. RNA extraction and purification was done for all the specimen using the Invitrogen, PureLink Viral RNA/DNA Mini Kit by ThermoFisher scientific, with each kit containing

50 reactions. By following the kit manufacturer's instructions and recommended procedures, we were able to obtain highly purified RNA. In the initial months of the pandemic, the nasopharyngeal samples were tested using the National Institute of Virology (NIV), Pune-developed kits as per the ICMR recommendations [20]. Extracted and purified RNA was reverse transcribed to c DNA and subsequently amplified using the ABI 7500 Fast DX RT-PCR thermocycler. The kit was a two-step kit wherein the *E* gene was used for the screening test. All those specimens came out to be positive by screening test were confirmed by a second reaction targeting the *ORF* and *RdRP* genes as per the NIV protocol [21]. Later during the pandemic, several other test kits have been used, like the Modified Thermo Fisher TaqPath COVID-19 SARS-CoV- 2 test (*ORF*1ab, N, and S gene detection), LabGun COVID-19 Assay (*RdRP,* E, and IC detection) etc. To ensure the integrity and verification of RT-PCR assay results, an internal control (IC) was analyzed for each patient sample, also testing one replicate of the positive control and one replicate of the negative control in each batch. A cycle threshold value (Ct value) < 35 was defined as a positive test result, and a Ct value of ≥ 40 was defined as a negative test result. A Ct value of 35 to less than 40 was reported as Inconclusive, with a request to repeat sampling (Images 1,2 &3).

3. RESULTS

A total of 2,17,665 samples from clinically suspected cases of COVID-19 were collected and analyzed at the VRDL division of our department over a period of one year from, March, 2020 to March 2021. Out of them 1,33,474 (61.3%) were males and 84,191 (38.7%) were females. The overall mean age was 34.3 years (range 0 – 102 years). Age wise groups were as follows, neonates (*n*=253), 1–9 (*n*=7452), 10–19 (*n*=24,388), 20–29 (*n*=56,688), 30–39 (*n*=51,849), 40–49 (*n*=31,461), 50–59 (*n*=21,151), 60–69 (*n*=14,862), 70–79 (*n*=7193), 80–89 (*n*=2056), 90–99 (*n*=292), ≥ 100 (*n*=20). The detailed distribution of source of the samples received is shown in Table 1, with the highest contribution of samples coming from the VRDL division of department of Microbiology, GMC, Srinagar (*n*=60,567, 27.8%). Among the total, 42,189 (19.3%) patients had a history of contact

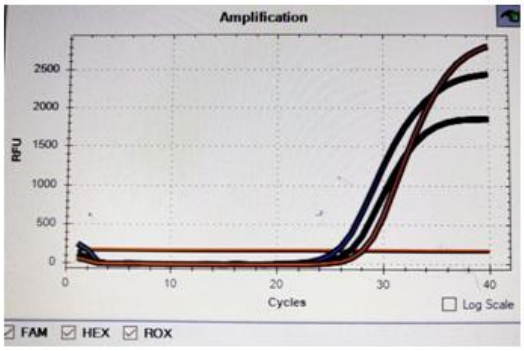

Image 1

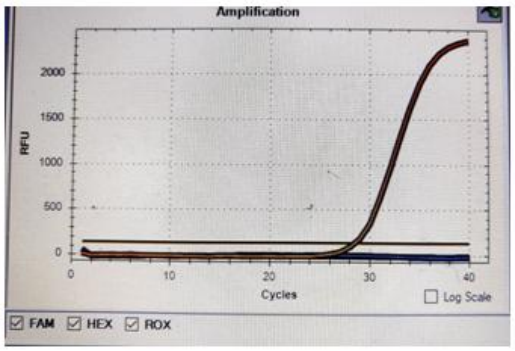

Image 2

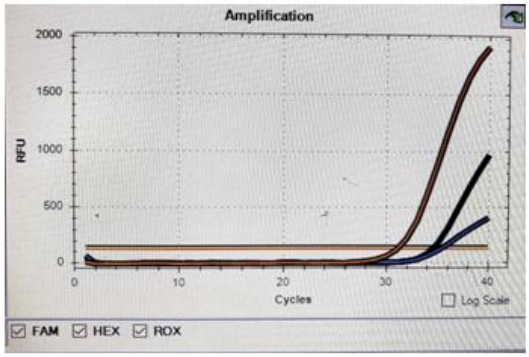

Image 3

Images. RT-PCR analysis curves showing positive (1), negative(2) and inconclusive(3) results

a with lab confirmed case SARS-CoV-2. A total of 7,905 health care workers (HCW's) were tested during this study. Also, a total of 14,273 women seeking ante-natal care were screened during this period. Among the total, 26,402 (12.2%) persons were admitted to different hospitals of the Kashmir division, while 3,730 (1.7%) patients had presented with severe acute respiratory illness (SARI) when tested for SARS-CoV-2 (Table 1).

Of the total 2,17,665 patients, 24,009 (11%) tested positive for SARS-CoV-2 infection by RT-PCR, among them 15,254 (63.5%) were males while 8755 (36.5%) were females. The mean age observed was 35.3 years (Range 0 – 98 years). The youngest case observed was a neonate, whereas the oldest was a 98 year old male. Also, 2,748 results were declared Inconclusive (according to the kit manufacturer's instructions) and 886 specimen were rejected for various reasons [Fig 1]. The highest positivity was observed in the age group of 30 – 39 years (*n*=5297, 22%), followed by 20 -29 years (*n*=4885, 20.4%), 12 (0.1%) neonates also tested positive for SARS-CoV-2 (Table 2). The highest number of positive cases were reported from the specimen received from the jurisdictions of district Srinagar (*n*=12748, 53%), followed by district Pulwama (n=3311, 13.8%) [Fig 2]. A significant number of positive cases were also observed among personnel of Army, paramilitary and state police (n=2334, 9.7%) [Fig 2]. Out of 24,009 positive cases, 4658 (19.4%) had a history of contact with a lab confirmed case of SARS-CoV-2. Among the positive cases, 1043 (4.3%) were HCW's (doctors, paramedics and hospital support staff) and 632 (2.6%) were pregnant females. 929 (3.9%) patients who tested positive for SARS-CoV-2 had presented with SARI. Also, among the positive cases, 4713 (19.6%) patients were admitted in various hospitals across the Kashmir valley [Table 1]. Amongst lab confirmed positive cases, fever was the most common symptom, and was present in 62% of the patients, followed by cough (41%) and fatigue / malaise was reported by 37% of patients. Also among positive cases, associated comorbidities were present in 5580 (23.2%) patients, of which Hypertension (*n*=2593, 10.8%) was the most common, followed by COPD (*n*=1176, 4.9%) and Diabetes mellitus (*n*=960, 4%). 120 patients with malignant conditions also tested positive for SARS-CoV-2 infection [Table 3].

4. DISCUSSION

Coronaviruses are enveloped, single stranded, positive-sense RNA viruses having an unsegmented genome and can cause clinical diseases in humans that may extend from the common cold to more severe respiratory diseases like SARS and MERS. SARS-CoV-2 is a member of the order *Nidovirales*, family *Coronaviridae*, and subfamily *Orthocoronavirinae*. Based on molecular characterization, SARS-CoV-2 is placed in the genera *Betacoronavirus* and subgenus Sarbecovirus [22]. SARS-CoV-2 causing COVID-19 disease has emerged as one of the most infectious pathogen known to humans, causing severe acute respiratory illness (SARI) along with MERS and Influenza A/H1N1. Initial studies from China demonstrated COVID-19 to be a

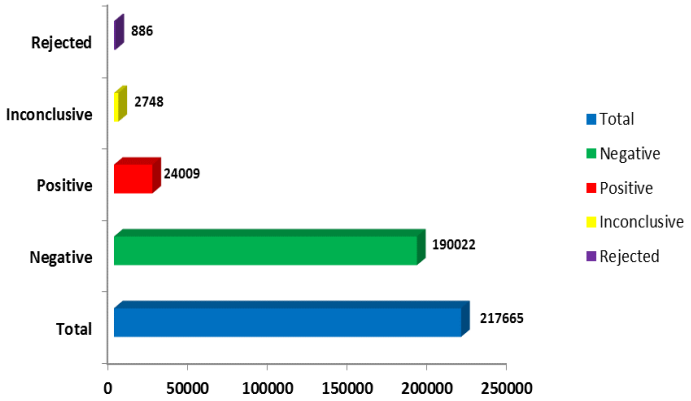

Fig. 1. Status of total specimen tested for SARS-CoV-2

Table 1. Baseline parameters of COVID-19 screened population

Total participants (n=217665)	***n* (%)**	
Males	133474 (61.3%)	
Females	84191 (38.7%)	
Sample distribution (n=217665)	***n* (%)**	**Positive cases (%)**
GMC &AH	60567 (27.8%)	10002 (16.5%)
GDC, Srinagar	7236 (3.3%)	346 (4.8%)
CMO, Srinagar	26704 (12.3%)	2400 (9%)
CMO, Anantnag	14471 (6.6%)	1161 (8%)
CMO, Pulwama	40753 (18.7%)	3311 (8.1%)
CMO, Kulgam	4619 (2.1%)	379 (8.2%)
CMO, Shopian	7558 (3.5%)	502 (6.6%)
CMO, Budgam	82 (0.04%)	13 (15.8%)
CMO, Ganderbal	3870 (1.8%)	121 (3.1%)
CMO, Baramulla	24145 (11.1%)	2566 (10.6%)
CMO, Kupwara	5481 (2.5%)	508 (9.3%)
CMO, Bandipora	5158 (2.3%)	329 (6.4%)
Jammu division	4259 (2%)	37 (0.9%)
Army, Millitary & police	12762 (5.9%)	2334 (18.3%)
RT-PCR positive (n=24009)	***n* (%)**	
Males	15254 (63.5%)	
Females	8755 (36.5%)	
H/O Contact with COVID-19 case (n=42148)	***n* (%)**	
Tested positive (RT-PCR)	4658 (11.1%)	
Tested negative (RT-PCR)	37490 (88.9%)	
Health care workers (n=7905)	***n* (%)**	
Tested positive (RT-PCR)	1043 (13.2%)	
Tested negative (RT-PCR)	6862 (86.8%)	
Pregnant women (n=14273)	***n* (%)**	
Tested positive (RT-PCR)	632 (4.4%)	
Tested negative (RT-PCR)	13641 (95.6%)	
SARI on presentation (n=3730)	***n* (%)**	
Tested positive (RT-PCR)	929 (24.9%)	
Tested negative (RT-PCR)	2801 (75.1%)	
Admitted to hospital (n=26402)	***n* (%)**	
Tested positive (RT-PCR)	4713 (17.9%)	
Tested negative (RT-PCR)	21689 (82.1%)	
Not admitted to hospital (n=191263)	***n* (%)**	
Tested positive (RT-PCR)	19296 (10%)	
Tested negative (RT-PCR)	171967 (90%)	

GMC=Govt. Medical college, AH=Associated hospital, GDC=Govt. Dental college, CMO=Chief medical officer, H/O=History of, SARI=Severe acute respiratory illness.

Table 2. Age and gender-wise distribution of COVID-19 patients

Age group (years)	**Male N (%)**	**Female N (%)**	**Total N (%)**
Neonates	07	05	12 (0.1)
1 – 09	292	253	545 (2.3)
10 – 19	777	657	1434 (6)
20 – 29	3229	1656	4885 (20.4)
30 – 39	3530	1767	5297 (22)
40 – 49	2779	1291	4070 (16.9)
50 – 59	1843	1262	3105 (12.9)
60 – 69	1609	1111	2720 (11.3)
70 – 79	870	575	1445 (6)
80 – 89	269	155	424 (1.8)
90 – 99	49	23	72 (0.3)
Total	15,254 (63.5%)	8755 (36.5%)	24,009 (100%)

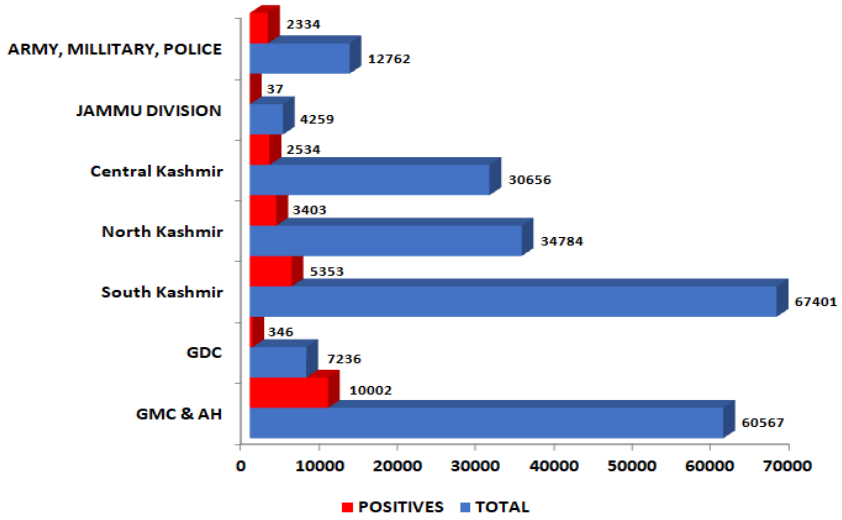

Fig. 2. Sample distribution (total and positives)

Table 3. Clinical profile of COVID-19 patients

Clinical features (*n*=24,009)	**Values**	
Age (mean, median)	35.34, 32	
Sex (Male:Female), %	63.5:36.5	
Presenting symptoms *n* (%)		
Fever	14,886 (62%)	
Cough	9844 (41%)	
Fatigue or malaise	8884 (37%)	
Myalgia	5763 (24%)	
Shortness of breath	4003 (16.6%)	
Headache	2641 (11%)	
Chills or rigor	1680 (7%)	
Loss of smell/taste	1273 (5.3%)	
Nasal congestion	960 (4%)	
Sore throat	720 (3%)	
Rhinorrhea	480 (2%)	
Diarrhea	480 (2%)	
Nausea and vomiting	242 (1%)	
Abdominal pain	140 (0.6%)	
Comorbidities *n* (%)	**ARI**	**SARI**
Hypertension (HTN)	864 (3.6%)	1729 (7.2%)
COPD	336 (1.4%)	840 (3.5%)
Diabetes mellitus	336 (1.4%)	624 (2.6%)
Cardiovascular diseases	192 (0.6%)	288 (1.2%)
Hypothyroidism	48 (0.2%)	24 (0.1%)
Malignancy	43 (0.2%)	77 (0.3%)
CKD	48 (0.2%)	96 (0.4%)
Pulmonary tuberculosis	08 (0.03%)	16 (0.07%)
Pancreatitis	03 (0.02%)	08 (0.03%)
Multiple comorbidities	408 (1.7%)	1152 (4.8%)

respiratory illness with a spectrum ranging from mild illness (81%), severe respiratory distress (14%) and critical illness in 5%, with a case fatality rate (CFR) of around 2.4% [23]. The COVID-19 pandemic has had a major impact on clinical microbiology laboratories in the past one year. The ongoing pandemic has affirmed the importance of the laboratory diagnosis of SARS-CoV-2 infection in order to diagnose, limit the spread, and promptly treat those patients who have a serious infection. The preferred testing method is the real-time reverse transcription-

PCR (RT-PCR) test [24]. This retrospective study is one of the first of its kind from our region and demonstrates the clinico-demographic profile, prevalence, and the predominant risk factors of COVID-19 patients among the population of the northern Indian state of J&K's Kashmir division.

As of June 8th, 2021 the state of J&K has reported a total of 3,01,467 positive cases of SARS-CoV-2 infection, out of which 1,86,290 cases are from the Kashmir division (10 districts) [6]. Our dedicated BSL III, Virology lab has reported 24,009 positive cases of SARS-CoV-2 infection out of a total 2,17,665 patients tested during the first year of this pandemic. An overall positivity rate of 11% observed. Our institute has reported close to one third (32%) of the total positive cases from Kashmir division and around 18.8% cases of the whole state, indicating a high burden and the magnitude of work that has been carried out by the department of Microbiology, GMC, Srinagar.

In our study, majority of the positive cases were males (63.5%), while 36.5% were females. Indicating a high male preponderance. The mean age observed was 35.3 years and the median age was 32 years (Range 0 – 98 years). The highest positivity was observed in the age group of 30 – 39 years (22%), followed by 20 -29 years (20.4%), and 40 – 49 (16.9%). In a similar study by Khan M, et al. in Peshawar, Pakistan, it was found that among 121 RT-PCR positive patients, 70.25% were male, while 29.8% were females, the majority of the cases were between 25 to 60 years old [25]. In another study by Soni et al. conducted at PGI, Chandigarh, India, they found the median age of 33 years, which is similar to our finding [26]. Gupta et al. in their study observed the mean age of participants to be 40.3 years (range 16-73 years) and a male preponderance (66.7%) among patients testing positive for SARS-CoV-2 infection [27]. Patients testing positive for SARS-CoV-2 infection in our study were younger (median age=32 years) when compared to those in China (median age=56 years) [28] and New York (median age=63 years) [29]. In most of the developing countries, males are the working members in majority of the households, thereby exposing themselves in work places and explaining the higher preponderance. The high infection rates among adolescents and young adult population can be attributed to the higher outdoor exposure and subsequent chances of them getting infected from cases in crowded areas, events and work places. Also, non-adherence to preventive measures (Safe distancing, masks, hand washing) can also make them susceptible for contracting COVID-19.

In our study, 12 (0.1%) neonates (0 – 28 days old), 545 (2.3%) children aged 1 – 09 years, and 1434 (6%) children aged 10 – 19 years tested positive for SARS-CoV-2 infection during the course of this study. A cumulative percentage of 8.4% of the total cases were from the age group of 0 -19 years. Colomer F, et al. in his study, Neonatal Infection Due to SARS-CoV-2 observed a total of 40 cases, 26 community-acquired and 14 nosocomial [30]. In another study by Lu X, et al. in Wuhan, China, of the 1391 children assessed and tested a total of 171 (12.3%) were confirmed to have SARS-CoV-2 infection, the median age of the infected children was 6.7 years [31]. These findings are similar to findings of our study. Lu Q, et al. in his study observed that COVID-19 is usually milder in children than in adults, and especially in neonates, and may be accompanied by non-specific symptoms [32]. The lower incidence of infection in neonates and young children can be credited to asymptomatic nature and non-specific symptoms that make it difficult both for parents and pediatricians to suspect and subsequently screen for COVID-19.

In the present study, 62% of total positive cases were symptomatic at the time of testing for SARS-CoV-2. Fever (62%), cough (41%), Fatigue/Malaise (37%) were the predominant symptoms, while gastrointestinal symptoms (3.6%) were relatively infrequent. In a similar study conducted by Soni et al. the common presenting complaints were fever in 37 (77.1%) followed by cough in 26 (54.2%) patients [26]. In another study conducted by Wu, F et al. who reported fever, cough and sputum production as the predominant symptoms among patients requiring hospitalization with COVID-19 [33]. These observations are quite similar to our findings. Guan et al. (Fever 44%, cough 68%, and diarrhea 4%) [34] and Khan M, et al. (Fever 72%, cough 59.5%) [25] also have reported observations similar to our study. In a study from New Delhi, India by Gupta et al. symptoms were observed in 42.9% of cases with fever an cough being the most common [27]. Fever as the predominant symptom in overwhelming cases indicates an early Interleukin mediated systemic response to initial infection or a localized inflammatory response to the respiratory tract infection [22]. Higher percentage of respiratory symptoms and relatively lower rates of gastrointestinal symptoms suggest the role of viral tropism [35].

In our study, 23.2% of total SARS-CoV-2 positive cases had some underlying medical condition or comorbidity. Hypertension 10.8% (3.6% ILI & 7.2% SARI) was the most common, followed by COPD 4.9% (1.4% ILI & 3.5% SARI) and Diabetes mellitus 4% (1.4% ILI & 2.6% SARI). 6.5% (1.7% ILI & 4.8% SARI) patients had multiple comorbidities. In a similar study by Khan M, et al. prevalence of comorbidities was 38 %, hypertension (12.3 %) and diabetes (10.7 %) [25]. In another study by Soni et al. 29.8% patients had associated comorbid condition of varying severity, these included hypertension in 16.6%, diabetes in 14.9% and chronic renal disease in 2.6% patients [26]. Gupta et al. reported hypertension in 23.4% as the most common comorbidity among COVID-19 patients [27]. These findings are in concordance with the findings of our study. An overall increased risk among people with comorbid conditions, particularly chronic, lifestyle related diseases has put an added burden on an already high mortality and morbidity numbers associated with COVID-19.

In the present study, of the total positive cases, 19.4% had a history of contact with a lab confirmed case of SARS-CoV-2. Gupta et al. in his study observed eleven (52.4%) patients had a history of contact with a lab-confirmed COVID-19 patient [27]. High rate of infectivity has been is a hallmark of SARS-CoV-2, which explains the magnitude of the spread of this disease. Among the positive cases, 1043 (4.3%) were HCW's (doctors, paramedics and hospital support staff). Overall, health care workers (HCW's) are at risk for SARS-CoV-2 infection [36]. In a study by Shah et al. involving the NHS employees of United Kingdom, there were concerning findings regarding the risks of COVID-19 among HCW's and their households. With one in six of all hospital admissions with COVID-19 in the working age population (18-65 years) or 17.2% (360/2097) being HCW's or their households [37]. HCW's have been at the forefront of this pandemic right from the day one and preventing COVID-19 infections among HCW's is very important for reducing morbidity and mortality, sustaining the health system capacity, and reducing secondary transmission.

In our study, amongst positive cases, 632 (2.6%) were pregnant females. Nayak A.M, et al. in his study observed 141 (14.4%) out of 977 pregnant women had tested positive for SARS-CoV-2 and concluded that, there is no significant effect of COVID-19 infection on maternal and foetal outcome in pregnancy and there is no evidence of vertical transmission of the COVID-19 infection but long-term follow-up of these babies is recommended [38]. Pregnancy is regarded as an immunocompromised status in some aspects, especially since maternal immunity is altered to tolerate fetal antigens by suppressing cell-mediated immunity and many may experience increased susceptibility to certain intracellular pathogens, including bacteria and viruses [39]. Therefore, it's essential for all pregnant women to take utmost precautions during the ante-natal period and protect themselves and their new born at the time of delivery.

5. CONCLUSION

There have been very few events in mankind's history of this magnitude, which have left devastating trails of health care crises and economic fallouts. Our study is one of the first of its kind from our region, where we tried to demonstrate the clinico-demographic profile and prevalence of COVID-19 among the population during the first year of the pandemic. This exhaustive study gives us an insight into the high risk behavior and appropriate preventive measures needed to be taken. While we tested 2,17,665 patients belonging to various districts of our region and found 11% positivity. Highest number of positive cases (53%) were from the summer capital of Srinagar. Severe disease was seen in 3.9% patients only. High percentage (62%) of people who tested positive for SARS-CoV-2 infection were symptomatic at presentation and fever was the most common presenting symptom. Significant number (19.4%) of people with history of contact with a positive case tested positive. A number of HCW's working at the forefront also contracted the infection. The pandemic is far from over and with the second wave already going on; it becomes imperative to continue with all the precautions that have been in place for the past year. It's also important that we continue to test, trace and isolate all the suspected cases aggressively. Infection prevention and control protocols at all hospitals, high risk settings and at the community level need to be strictly implemented and followed.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

This study was approved by the institutional ethical clearance committee.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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