

## Epidemiological and Clinical profile of SAR-CoV-2 positive patients diagnosed at a Rural Medical college of North India

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### Abstract

**Introduction:** COVID-19 is an infectious disease caused by a newly discovered coronavirus-Severe Acute Respiratory Syndrome Corona Virus-2 (SARS CoV-2). The first cluster of cases was reported from Wuhan in China in December 2019 and it soon spread across the whole world in a very short period.

**Objective:** To study epidemiological and clinical profile of all SAR-CoV-2 (COVID-19) positive patients who were diagnosed at GMC Rajouri.

**Material and methods:** A Cross-sectional study design in which all the COVID-19 positive patients who were diagnosed by RT-PCR at GMC Rajouri from 1<sup>st</sup> January 2021 to 15<sup>th</sup> May 2021 were studied prospectively.

**Results:** A total of 87 patients were studied, out of which 73.6% were male. 34.5% (30) patients think that they contracted the COVID-19 at workplace while some 22 (25.3%) patients think they got infected from family members. 62 % of the patients were symptomatic and the most common symptom of presentation was sore throat followed by headache and fever.

**Keywords:** Coronaviruses, COVID-19, SARS-CoV-2.

### INTRODUCTION:

Coronaviruses mainly cause respiratory and gastrointestinal tract infections and are genetically classified into four major genera: Alphacoronavirus, Betacoronavirus, Gammacoronavirus, and Deltacoronavirus (1). The former two genera primarily infect mammals, whereas the latter two predominantly infect birds (2). Coronaviruses did not attract worldwide attention until the 2003 SARS pandemic, followed by the 2012 MERS and, most recently, the 2019-nCoV outbreaks (3, 4). SARS-CoV and MERS-CoV are considered highly pathogenic (5), and it is very likely that both SARS-CoV and MERS-CoV were transmitted from bats to palm civets (6) or dromedary camels (7), and finally to humans (5). The genome of coronaviruses ranges between approximately 26,000 and 32,000 bases, includes a variable number (from 6 to 11) of open reading frames (ORFs)

(4). The first ORF representing approximately 67% of the entire genome encodes 16 non-structural proteins (nsps), while the remaining ORFs encode accessory proteins and structural proteins (5). The four major structural proteins are the spike surface glycoprotein (S), small envelope protein (E), matrix protein (M), and nucleocapsid protein (N). The spike surface glycoprotein plays an essential role in binding to receptors on the host cell and determines host tropism (1, 8). The spike proteins of SARS-CoV and MERS-CoV bind to different host receptors via different receptor-binding domains (RBDs). SARSCoV uses angiotensin-converting enzyme 2 (ACE2) as one of the main receptors (9) with CD209L as an alternative receptor (10), whereas MERS-CoV uses dipeptidyl peptidase 4 (DPP4, also known as CD26) as the primary receptor. Initial analysis suggested that 2019-nCoV has a close evolutionary association with the SARS like bat coronaviruses (11).

During the last two decades, the world has faced a number of potentially deadly coronavirus (CoV) outbreaks that have caused severe diseases such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) (12, 13). COVID-19 is an infectious disease caused by a newly discovered coronavirus-Severe Acute Respiratory Syndrome Corona Virus-2 (SARS CoV-2). The first cluster of cases were reported from *Wuhan* in *China* in December 2019 and it soon spread across the whole world in a very short period. In the beginning, an association with a seafood market selling live animals in Wuhan, where most of the earlier patients having pneumonia had worked or visited, was recognized. However, as the epidemic disease grew, person-to-person transmission became the principal means of spread. COVID-19 infection is spread using large droplets produced during coughing and sneezing by symptomatic cases but may also happen from asymptomatic individuals before starting of their symptoms (14). These infected droplets can travel 1–2 meters and later put down on surfaces. Droplets normally do not extend more than 2 meters and do not hang on in the air. The virus could stay viable on surfaces for days in desirable environmental conditions but are ruined in less than a minute by regular disinfectants, such as sodium hypochlorite and hydrogen peroxide (15). The primary route of transmission of the disease from person to person is through droplets released during coughing, sneezing and speaking by an infected person. These droplets are relatively heavy, do not travel far and quickly sink to the ground (16). Globally, as on date, there have been 75,72,64,511 confirmed cases of COVID-19, including 68,50,594 deaths (reported to WHO). In India, there were 4,46,85,799 cases, 5,30,764 deaths, and 4,41,52,945 recovered (17,18). The objective of this case series from rural north India is to study demographic and clinical profile of all SAR-CoV-2 (COVID-19) positive patients who were diagnosed at GMC Rajouri.

## **MATERIALS AND METHODS:**

Government Medical College Rajouri is a tertiary care hospital in district Rajouri of Jammu Division of Union territory of Jammu and Kashmir. Associated hospital of GMC Rajouri provides clinical care and isolation facilities to COVID-19 patients. The current study is a cross-sectional case series of epidemiological and clinical manifestations of COVID-19 positive patients who were diagnosed by RT-PCR at GMC Rajouri from 1<sup>st</sup> January 2021 to 15<sup>th</sup> May 2021.

**Study Conduct:**

Suspected travelers, contacts of COVID-19 patients and other suspected persons as per National guidelines were subjected to nasopharyngeal swab sampling. Samples were tested for the presence of SARS-CoV-2 using a reverse transcriptase–polymerase chain reaction (RT-PCR) test. Once patients were confirmed as COVID-19 positive by the RT-PCR, they were shifted to isolation ward/ Covid-care Center/Home isolation depending upon the severity of symptoms. All laboratory-confirmed cases during the period of study were eligible for inclusion in this study. The epidemiological and clinical data was prospectively collected by person-to-person interview using a predesigned questionnaire and from the patient records available from the ward. The interviews were conducted by the trained staff of department of Community Medicine after taking informed consent.

**RESULTS:**

Total of 87 COVID-19 positive case were studied, out of which 64 (73.4%) were male and 23 (26.4%) were female. Median age of the patients was 35 years (Range 5 to 85 years). Majority of the patients 30 (34.5%) were in the age group of 16 to 30 years followed by age group 46 to 60 years which constituted 32.2 % (28). Only 9 (10.3%) patients were from outside state while all other 78 (89.7%) belongs to district Rajouri of J&K union territory. 26 (29.9%) patients were found to be smokers. 34.5% (30) patients think that they contracted the COVID-19 at workplace while some 22 (25.3%) patients think they got infected from family members (*Table 1*).

**Table 1: Socio-demographic profile of COVID-19 positive patients**

Variable	Group	Frequency	Percentage
Age	0-15 Years	5	5.7
	16-30 Years	30	34.5
	31-45 Years	17	19.5
	46-60 Years	28	32.2
	> 60 Years	7	8
Gender	Male	64	73.6
	Female	23	26.4
Residence	District Rajouri	78	89.7
	Outside State	9	10.3
Smoking	Yes	26	29.9
	No	61	70.1
History of Travel	Yes	8	9.2
	No	79	90.8
Suspected exposure to COVID-19 Patient Positive	Family Member	22	25.3
	Work Place	30	34.5
	Others	6	6.9
	Uncertain	29	33.3
Occupation	Healthcare worker	14	16.1
	Army men	9	10.3
	Shopkeeper	10	11.5
	Teacher	12	13.8
	Pvt. Sector workers	8	9.2
	Housewife	16	18.4
	Labourer	5	5.7
Students	13	14.9	

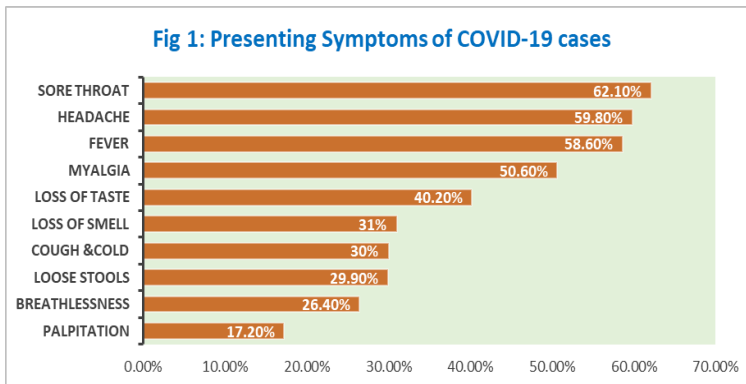
Out of 87 total patients 54 (62%) were symptomatic. Details of symptoms felt by the patients is given in **Table 2 and Figure 1**. **Table 3** shows mean/median duration of symptoms and duration of isolation of COVID-19 patients.

**Table 2: Profile of Symptoms in COVID-19 patients**

Variable	Group	Frequency	Percentage
Symptomatic	YES	54	62
	NO	33	38
Wear facemask	YES	61	70
	NO	26	30
Cough & Cold	YES	26	30
	NO	61	70
Sore Throat	YES	54	62.1
	NO	33	37.9
Fever	YES	51	58.6
	NO	36	41.4
Headache	YES	52	59.8
	NO	35	40.2
Body aches/ Myalgia	YES	44	50.6
	NO	43	49.4
Breathlessness	YES	23	26.4
	NO	64	73.6
Loss of Smell	YES	27	31
	NO	60	69
Loss of Taste	YES	35	40.2
	NO	52	59.8
Loss of appetite	YES	55	63.2
	NO	32	36.8
Loose Stools	YES	26	29.9
	NO	61	70.1
Palpitation	YES	15	17.2
	NO	72	82.8
Comorbidities	<i>HTN</i>	13	15
	<i>DM</i>	8	9
	<i>None</i>	66	76

**Table 3: Depicting mean and median duration of Symptoms and duration of isolation**

	Duration of Symptoms	Duration of Isolation
<b>Mean</b>	10.29 days	12.61 days
<b>Median</b>	10 days	14 days
<b>Min.</b>	3 days	2 days
<b>Max.</b>	28 days	21 days



## DISCUSSION:

During 1<sup>st</sup> January 2021 to 15<sup>th</sup> May 2021, a total of 87 cases were diagnosed at Government medical college, Rajouri J&K India. 73.6% of the patients were males and most the patients (51.7%) were in the age group of 31–60 years. The male preponderance (73.6%) may be related to their outdoor activities and travel. Similar results were observed in a study conducted in New Delhi (19). Jin Jin Zhang et al (20) in a study in Wuhan found that the proportion of males and females were almost equal, the median age of the cases was 57 years and 70% of the cases were aged more than 50 years. Similarly Sijia Tian et al (21) found during the early phase of the pandemic, that the median age of the patients among the admitted hospitals across Beijing was 47.5 years and the proportion of females was slightly more than the males. Pranab Chatterjee et al reported the mean age of the cases as 34.73 years in a case control study among health care workers in India (22).

In our study, only 8 patient had a history of travel while 66.7 % were exposed to a laboratory-confirmed COVID-19; out of which 25.3% cases had exposure from family members while 34.5% had exposure at work place (mainly health care setting). Majority of the cases reported no history of travel which suggests that local and to small extent community transmission is going on in this city. 62 % of the patients were symptomatic and the most common symptom of presentation was sore throat followed by headache and fever. These findings are in contrast to findings of a case series study by Nitesh Gupta et al. who found fever as the most common symptom (19). This might be due to the fact that our case series had 87 patients compared to study conducted by Nitesh Gupta et al who had only 21 patients. Clinical characteristics among patients admitted in Wuhan (20) revealed a similar picture with slightly higher percentage of cases suffering from symptoms, that is 91% patients had fever, 75% cough, 36.7% having dyspnoea and 39.6% had Gastrointestinal symptoms. In a study conducted in patients admitted in China (23) till January 2020, 43.8% patients had fever and 67.8% had cough. In another study conducted in Beijing (21) the most common symptoms were fever (82.1%) and cough(45.8%). The reason for comparatively lesser patients in our study presenting with fever and cough could be that we included all the patients who were tested at GMC Rajouri whereas in other studies, mostly symptoms of indoor patients were described.

In our study, 15 % of the cases were hypertensive and 9% patients were found to be diabetic. In other studies conducted in Wuhan, Korea and China the prevalences of comorbidities among cases were; hypertension 30% Wuhan (20), 14.2% Korea (24) and 15% in China (23) while diabetes was found to be 12.1% in Wuhan (20), 14.2% in Korea (24) and in China (23) around 7.4%. There was slight differences in the occurrence of comorbidities among the RT-PCR positive cases which can be attributed to different study setting, different study designs and wide variability in the sample size of various studies.

## CONCLUSION:

Majority of COVID-19 patients diagnosed at a tertiary care hospital in rural India presented with mild symptoms in the form of sore throat, fever and myalgia. Public health measures for the containment of spread is crucial determinant of the final mortality and morbidity due to COVID-19 pandemic. Smaller proportion of patients having travel histories suggests local and to small extent community transmission. Availability of effective COVID-19 vaccines provide strong protection against serious illness, hospitalization and death.

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