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Clinicodemographic And Cutaneous Manifestation In Sars Cov-2 Infection

Dr Sneha Mohan[1], Dr. Azra Ferheen Chaudhary[2], Dr. Parul Singhal[3], Dr. Mukesh Manjhi[4]*

[1]Assistant Professor, Department of Microbiology Government Institute of Medical Sciences, Greater Noida
Email ID: doc.snehamohan@gmail.com
[2]Assistant Professor, Department of Dermatology School of Medical Sciences & Research, Sharda University
Email ID: aferheen@gmail.com , ORCID ID: 0000-0001-7497-5212
[3]Associate professor, Department of Microbiology KD medical college, Mathura
Email ID: singhal.smileparul@gmail.com
[4]Professor and Head, Department of Dermatology Hamdard Institute of Medical Sciences & Research, New Delhi
Email ID: drmukeshmanjhi13@gmail.com , ORCID ID: 0009-0002-3282-607X

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ABSTRACT

Introduction: Acute respiratory infections have emerged as a critical public health concern worldwide, with COVID-19, caused by the SARS-CoV-2 virus, being at the forefront. This virus has not only led to significant morbidity and mortality but has also been associated with a range of clinical symptoms that extend beyond the respiratory system.

Aims and Objectives: The primary aim of this study is to investigate the clinic demographic profile and cutaneous manifestation of patients with confirmed SARS-CoV-2 infections.

Materials and Methods: This retrospective observational study was conducted over a period of 13 months, from April 2022 to May 2023, at a tertiary care hospital. A total of 4,762 nasopharyngeal swabs were collected for RT-PCR testing, resulting in 285 confirmed cases of COVID-19. Data regarding demographic details, clinical symptoms, and any skin- related symptoms were systematically gathered through structured telephone interviews conducted with the patients or their caregivers.

Results: The analysis revealed that the mean age of the 285 patients was 36.06 years, with a predominance of male patients (62.5%). The most frequently reported symptoms included fever (96.5%), myalgia (95.4%), and cough (78.6%). Notably, cutaneous manifestations were identified in 5.6 % of the patients, with the urticarial rash being the most prevalent..

Keywords: *SARS-CoV-2, covid toes, Comorbidities Impact on COVID-19 Severity*

1. INTRODUCTION

An acute respiratory infection is the most common health issue affecting all age groups and contributes to the world's disease burden. [1]The COVID-19 pandemic is responsible for the wider spread of infection thus resulting in more morbidities and mortality as compared to previous coronavirus diseases .[2] As of JULY, 2024, more than 520 912 257 confirmed cases of COVID-19 worldwide since the start of the pandemic cases have been reported, with more than 6 272 408 deaths.

SARS COV-2 virus is a complex disease affected by multiple factors like inherited conditions, genetic factor, along with comorbidities and other associated risk factors. The comorbid conditions are the modifiable factors which along with the non-modifiable factors which are age and gender influences the outcome of the COVID 19 infection, prognosis, morbidity and mortality.

Most of the COVID 19 patients complained of mild symptoms while only 14% individual presented with severe acute respiratory symptoms and required hospitalization .[3] Disease presentation range from being asymptomatic to acute severe respiratory distress. Most Common manifestation are fever, cough, malaise, shortness of breath, loss of sense of smell and taste. Severe disease, on the contrary, is characterized by dyspnea, blood oxygen desaturation, respiratory failure, and venous thromboembolism. Till date there are paucity of studies done on large sample size to evaluate its uncommon clinical and cutaneous manifestations

The estimated incidence of cutaneous manifestations secondary to COVID-19 is between 4% and 20.4%. 8. Skin

manifestations related to SARS-CoV-2 infection can be divided mainly into five groups: chilblain-like lesions (CBLLs), maculopapular eruptions, urticarial eruptions, vesicular eruptions, and livedo or necrosis.

AIMS AND OBJECTIVES OF THE STUDY

To study the Clinicodemographic profile and cutaneous manifestation in SARS CoV-2 infection at tertiary care hospital

INCLUSION CRITERIA

All COVID-19 positive patients (Admitted/Home isolated) who give their consent for participation in the study irrespective of symptoms.

EXCLUSION CRITERIA

Patients who turn out to be negative by RT-PCR for COVID-19.

Patients who were positive by COVID antigen test alone

Patients who do not give their consent for participation in the study

2. MATERIALS AND METHODS

An observational prospective study was carried out at BSL-2 Virology lab, as part of routine diagnostic test of COVID-19 from April 2022 to May 2023 from clinically suspected patients a total of 4762 nasopharyngeal swab samples (NPSs). During the study period, 285 were confirmed positive for SARS-CoV-2 infection. All individuals confirmed positive for SARSCoV-2 infection were further tested according to the ICMR guidelines.

Telephone interviews were conducted to inquire about symptoms related to skin conditions to all confirmed positive patients.

Data collection and Analysis

Nasopharyngeal/Oropharyngeal swabs received in laboratory were included for the study

Swab samples were subjected for further processing and RNA Extraction. Two target genes, RdRp along with a positive reference (RNase P) were analysed

All individuals confirmed positive for SARSCoV-2 infection were further tested according to the ICMR guidelines. For further analysis, demographic information along with clinical manifestation were collected through telephone and video calls.

Positive Ct value of the viral gene is 35 or less and negative when it is greater than 35.

Statistical analysis

The statistical analysis was conducted using SPSS 28, employing various methods to explore key aspects of the data. Firstly, comparisons were made between patients with and without comorbidities, investigating mean age, gender distribution, and prevalence rates of clinical features. Secondly, differences in mean viral load across different age groups and over time were examined to identify significant variations in viral load dynamics.

The patient's skin manifestations data was summarized using the frequency, percentage, mean and standard deviation, and data was presented using tables,

Results

Patient characteristics:

Out of the total samples tested during the study period, 285 were confirmed positive for SARS-CoV-2 infection. (table 1). During the study period, 285 were confirmed positive for SARS-CoV-2 infection. All individuals confirmed positive for SARSCoV-2 infection were further tested according to the ICMR guidelines. For further analysis, skin manifestations, demographic information along with clinical manifestation were collected telephonically.

I Demographic Data of SARS CoV-2 positive patients:

Out of 4762 tested patients for COVID-19 infection, 285 was confirmed for SARS CoV-2 infection by RT-PCR. In all 285 positive patients, the mean age was 36.06±16.9 (years) and 62.5% were represented by male and 37.5% were female patients. The most common affected age group was 20-29 years of age group with 29.5% followed by 30-39 age group (22.1%) as shown in Table 1 , Table 2 ,Fig 1 and Fig 2.

II Clinical characteristics in SARS CoV-2 positive patients:

Among all the SARS Cov-2 positive individuals, the most prevalent clinical feature was fever 275 (96.5%), myalgia 272 (95.4%) followed by cough (78.6%) and sore throat (80%). In our study, only 4 individuals complaint of dyspnoea 5 (1.8). And only few of the individuals presented with diarrhoea 3 (1.1) and loss of taste 1 (0.4) Table 1

III. Comorbidities:

Out of total SARS CoV-2 positive patients, only 31 (10.9%) had comorbidities and remaining 254 (89.1) were not associated with any comorbidities. The most common comorbidity associated was Diabetes Mellitus 12 (38.7%) followed by hypertension 8 (26%) and Asthma 5 (16.1%). Table 3

Table 1 shows the baseline characteristics, clinical features, and comorbidities of patients with confirmed SARS-CoV-2 infection.

Variable	Value
SARS CoV-2 Positive patients	285
Demographic data	
Age mean ± Standard Deviation (years)	36.06±16.9
Gender (N, %)	
Male	178(62.5)
Female	107(37.5)
Clinical features (N, %)	
Fever	275(96.5)
Myalgia	272(95.4)
Cough	224(78.6)
Sore Throat	228(80)
Cold	154(54)
Body ache and Headache	34(12)
Diarrhoea	3(1.1)
Loss of Taste	1(0.4)
Dyspnoea	5(1.8)
Comorbidities	
Individuals with comorbidities (N,%)	31 (10.9)
Individuals without comorbidities (N,%)	254 (89.1)

Table 2: Age wise distribution of SARS CoV-2 positive individual

AGE (years)	N (%)
<= 9	10 (3.5)
10-19	25 (8.8)
20 - 29	84 (29.5)
30 - 39	63 (22.1)
40 - 49	41 (14.4)
50 - 59	30 (10.5)
60 - 69	20 (7)
70 - 79	7 (2.5)
80+	5 (1.8)
Total	285

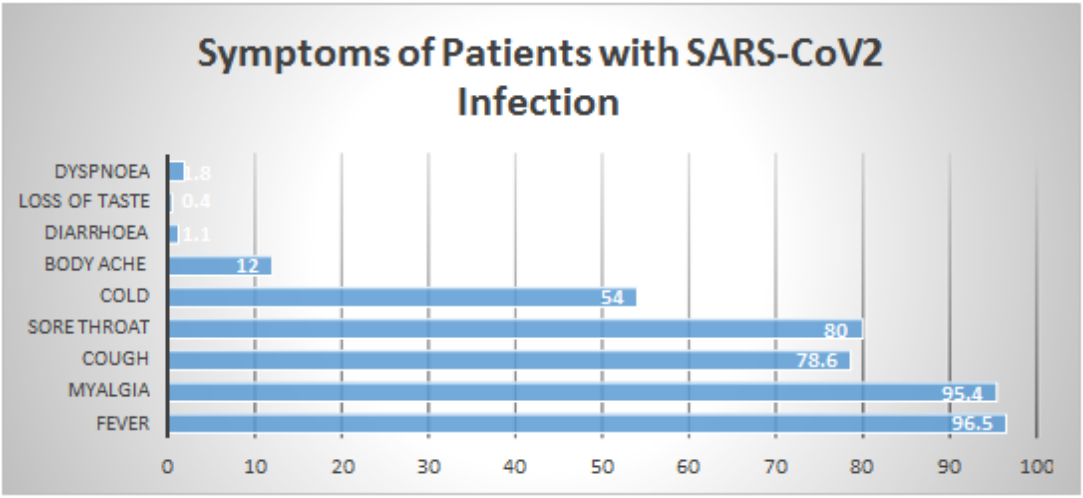

Fig 1 Clinical characteristics of SARS CoV-2 confirm patients

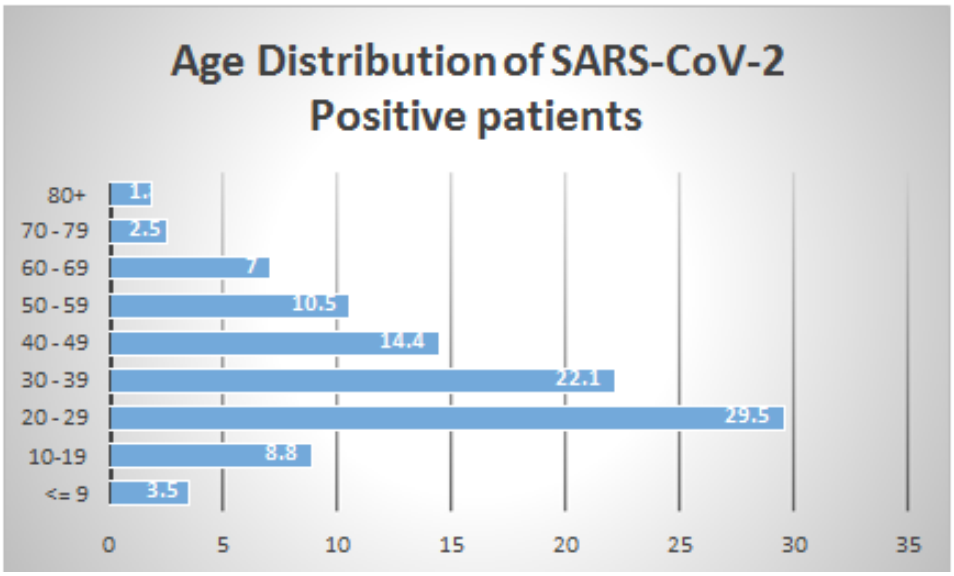

Fig 2: Age wise distribution of SARS CoV-2 positive individual

Table 3: Comorbidities:

Comorbidities	Value (N,%)
Diabetes Mellitus	12 (38.7)
Hypertension	8 (26)
Asthma	5 (16.1)
Hypothyroidism	2 (6.4)
Cardiovascular disease	2 (6.4)
Cancer	1 (3.2)
HIV	1 (3.2)

Characteristics of SARS COV-2 positive patients associated with comorbidities and without comorbidities:

All the enrolled individual presented with mild or moderate disease, as no patients were admitted in the hospital. Among all the 285 confirmed SARS CoV-2 cases, only 31 were associated with some comorbidities and remaining 254 had no previous illness. Baseline characteristic among SARS CoV-2 positive patients in relation to comorbidities is discussed below. Table 4.

III a. Characteristics of SARS CoV-2 positive patients without comorbidities (n=254) :

Demographic Data:

In all 254 positive patients without comorbidities, the mean age was 32.81±14.62 (years) and 61% were represented by male and 39% were female patients. The most common affected age group was 20-29 years of age group with 32.7% followed by 30-39 age group (24.8%). Age group ranging from 60 to 80 years were less commonly affected in the category of patients of without comorbidities.

Clinical characteristics:

Among all the SARS Cov-2 positive individuals, the most prevalent clinical feature was fever 246 (96.9%), myalgia 246 (96.9%) followed by cough (79.5%) and sore throat (81.5%). In positive patients associated with no previous illnesses, only 1 individuals complaint of dyspnoea 0.4%. And only few of the individuals presented with diarrhoea (0.8%) and loss of taste 1 (0.4).

III b. Characteristics of SARS CoV-2 positive patients with comorbidities (N=31) :

Demographic Data:

In all 31 positive patients associated with comorbidities, the mean age was 62.71± 10.15 (years) and 74.2% were represented by male and 25.8% were female patients. The most common affected age group was 60-69 years (45.2%) followed by 50-59 age group (9 %) as shown in table 6. Hence most commonly involved individual were elderly adults ,age group ranging from 50 -79 years. The young population were less commonly involved in the above category.

Clinical characteristics:

Among all the SARS Cov-2 positive individuals, the most prevalent clinical feature was fever 29(93.5%), myalgia 26 (83.9%) followed by cough 22 (71%) and sore throat 21 (67.7%).

While few patients presented with other signs and symptoms like diarrhoea was seen in only 1 patient and loss of taste was not presented in of the patients.

But 4 individuals complaint of dyspnoea 4 (13%), that were the patients who were associated with bronchial asthma.

Comorbidities :

Out of total SARS CoV-2 positive patients, only 31 (10.9%) had comorbidities and remaining 254 (89.1) were not associated with any comorbidities. The most common comorbidity associated was Diabetes Mellitus 12 (38.7%) followed by hypertension 8 (26%) and Asthma 5 (16.1%).

Table 4. Characteristics of SARS COV-2 positive patients associated with comorbidities and without comorbidities

Individuals without comorbidities (N=254)		Individuals with comorbidities (N= 31)	
Demographic data		Demographic data	

Age mean ± Standard Deviation (years)	32.81±14.62	Age mean ±SD (years)	62.71± 10.15
Gender (N, %)		Gender (N,%)	
Male	155(61)	Male	23(74.2)
Female	99(39)	Female	8(25.8)
Clinical features (N, %)		Clinical features (N, %)	
Fever	246 (96.9)	Fever	29 (93.5)
Myalgia	246 (96.9)	Myalgia	26 (83.9)
Cough	202 (79.5)	Cough	22 (71)
Sore Throat	207(81.5)	Sore Throat	21 (67.7)
Cold	136 (53.5)	Cold	18 (58.1)
Body ache and Headache	31(12.2)	Bodyache and Headache	3 (9.6)
Diarrhoea	2(0.8)	Diarrhoea	1 (3.2)
Loss of Taste	1(0.4)	Loss of Taste	0
Dyspnoea	1 (0.4)	Dyspnoea	4 (13)

Table 5: Age wise distribution in patients without comorbidities (N=254) with comorbidities: (N=31)

Without comorbidities		With Comorbidities	
AGE	Value n (%)	AGE	Value n (%)
<= 9	10 (3.9)	<= 9	-
10-19	25 (9.8)	10-19	-
20 - 29	83 (32.7)	20 - 29	1 (3.2)
30 - 39	63 (24.8)	30 - 39	-
40 - 49	41 (16.1)	40 - 49	-
50 - 59	21 (8.3)	50 - 59	9 (29)
60 - 69	6 (2.4)	60 - 69	14 (45.2)
70 - 79	2 (0.8)	70 - 79	5 (16.1)
80+	3 (1.2)	80+	2 (6.5)
Total	254	Total	31

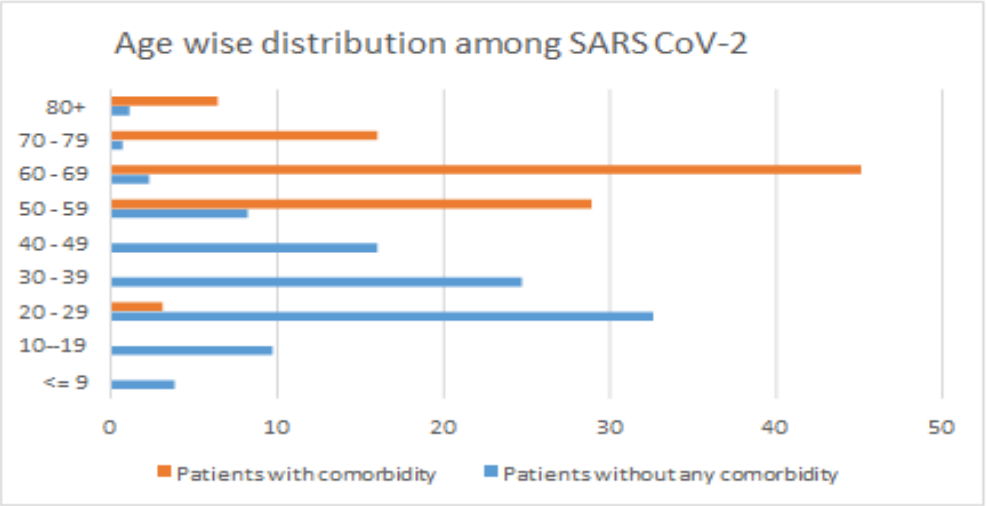

Fig 3 Age wise distribution in SARS CoV-2 Patients (N=285)

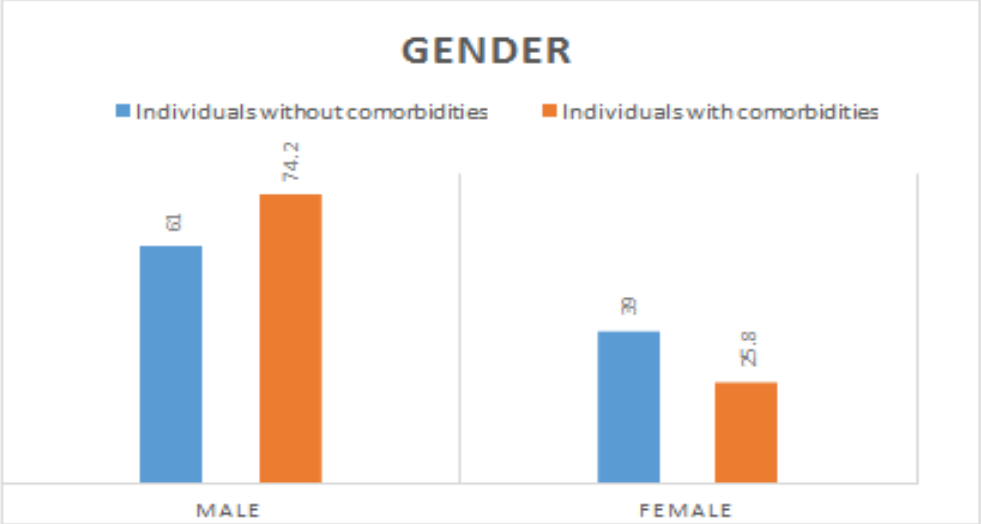

Fig 4 Gender distribution in SARS CoV-2 Patients (N=285)

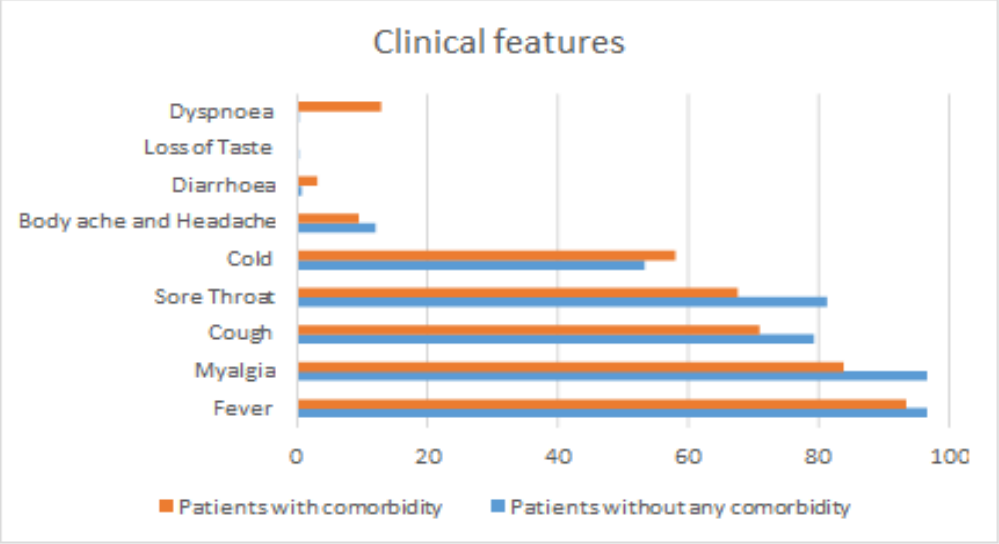

Fig 5 Clinical features in SARS CoV-2 Patients (N=285)

Dermatological manifestations

Out of a total of 285 patients, 16 experienced skin manifestations, including 10 females and 6 males. Among them, the most common dermatological manifestation was urticaria (n = 10), followed by morbilliform rash (n = 3), erythema multiforme (n = 2), and chilblain-like lesions (n = 1).

3. DISCUSSION

The purpose of our study was to describe the various clinical and cutaneous skin manifestations that can be associated during COVID-19 infection.

In our study, most of the cases involved were the non-hospitalized individuals, which could be due to the awareness of the disease and the government-led management guidelines available for mild to moderate cases. In this study clinical demographic features were analyzed .The previous studies done in the year 2020 included hospitalised or critically ill patients.

Demographic Data of SARS CoV-2 positive patients

Though our study was conducted from 2022 – 2023, during which cases were seen to decrease and also the people were getting immune to the infection, which affected our total number of cases but still the positivity rate almost remained the same, as observed. Out of the total samples received in the laboratory for SARS CoV-2 testing by RT-PCR, 285 cases were confirmed positive for the COVID-9 disease with a positivity rate of 5.9%. there were very few studies that have reported a positivity rate. One such study done by Sarkar B et al 2020 reported 7% positivity rate in one month. The studies done before were mostly carried out during the initial phase of pandemic when there was unawareness of the infection pathogenesis and its severity, which led further to panic and thus led to testing in large numbers.

Among all our SARS CoV-2 infected cases, male patients (62.5%) were more prevalent than female patients (37.5%) with male to female ratio 1.6:1. Similar results have been reported by Yu X et al. 2020, in which cases were more prevalent in male patients (62%) than in female (38%).[4] On the contrary, Fajnzylber J et al. 2020 and Cardillo L et al. 2021 have shown that females were infected with SARS CoV-2 infection more than male. This might be due to the presence of high expression of ACE-2 receptors in females.[5,6]

The mean age group affected in our study was 36.6 ±16.9 with 20-29 years the most common age group affected with 29.5% followed by 30-39 years (22.1%). Concordant results have been reported by Bustos P. et al. 2021, Yu F. et al. 2020 with mean age being 32.81±14.62 and 40 years (median age) respectively. As observed in our study, young to middle age group are more commonly affected , which were concordant with the results reported by Yu F. et al.

2020 and Bustos P. et al. 2021.[7,8] The young to middle age group individuals are more exposed due to outside work and that must have led to getting infection more commonly. The other studies have reported, elderly group (50 to 60 years) getting affected more than the younger population (Yu X. et al. 2020 and Huang Y. et al. 2020), this could be due to the critically ill patients being their sample type.[4,9]

Clinical features in SARS CoV-2 infected individuals:

In our study, the patient presented with a wide range of clinical signs and symptoms. The most common clinical features were fever (96.5%) and myalgia (96.5%) followed by sore throat (80%) and cough (78.6%). The concordant findings were reported by a study conducted by Yu X et al. 2020 with fever as the most common feature (91.3%) followed by cough (63%). In our study, dyspnoea was observed in only 1.8% of patients, which was far less than reported by Yu X et al. 2020 (4.3%) and Yu F. et al. 2020 (10.5%) and 69.5% in Knudtzen FC et al.[4,8,10] 2021. In our study, the subject population falls into mild to moderate cases where dyspnoea is less reported. The study done by Huang Y et al. 2020, have also reported fever (71.3%) as the most common feature followed by cough (86.6%), but this was observed in the hospitalized patients as compared to the non hospitalized patients, which showed sore throat(36.8%) and headache (58.6%) as the most common feature.[9]

Skin manifestations associated with COVID-19 infection are diverse and can vary significantly. Nearly 10% of patients develop skin symptoms before the onset of respiratory manifestations, with cutaneous signs emerging from a few days before to several days after a COVID-19 diagnosis. In our study, only 16 patients exhibited cutaneous features, which may be attributed to the limitations of physical examination.

Comorbidities in SARS CoV-2 infected patients:

Previous studies have reported that individuals associated with comorbidities have an increased risk of getting infected with the SARS CoV-2 virus (Cardillo L, et al. 2021 and Lescure F-X et al. 2020). It has been observed in the above studies that, elderly patients (> 65 years) are more prone or more susceptible to the infection. [6]

In our study, among a total of 285 SARS-CoV-2 confirmed patients, 89.1% of patients were not associated with any comorbidities while 10.9% of cases had a history of comorbidities. Similarly, a study done by Bustos P. et al. 2021 reported

that 91% of SARS-CoV-2-positive patients were not associated with any preexisting illnesses. On the contrary, the study done by Huang Y. et al. 2020, reported 75% of patients to be associated with some preexisting illness. This difference of percentage in the above study is seen because of the different study populations and different sample sizes. The study done by Huang Y. et al. 2020 , only included 16 ICU patients and it was carried out in the initial phase of the pandemic with no available information of the novel coronavirus.[7,9]

In 38(10.9%) positive patients associated with comorbidities, the most common comorbidity was diabetes mellitus (38.7%) followed by hypertension (26%). The results were discordant with the Yu X. et al. 2020, Knudtzen FC et al. 2021 findings, as they reported hypertension to be the most common comorbidity in their study population with 35.9% and 36% respectively. These studies have reported diabetes mellitus (9.8% and 11%) to be the second most common comorbidity associated with SARS CoV-2 infected patients. The study done by Huang Y. et al. 2020, have reported chronic cardiac disease as the most common comorbidity (63%) followed by 37% of diabetes mellitus. There is a high prevalence of diabetes mellitus in our population, which explains it as the most common comorbidity in our study.[4,9,10]

4. CONCLUSION

Our study focuses on the diverse clinico-demographic profile of SARS-CoV-2-positive patients. Unlike most previous studies, which were conducted in 2020 and primarily included hospitalized or critically ill patients, our research specifically examines cases with mild to moderate disease, addressing a gap in the existing literature.

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