



## Prevalence of COVID-19 Infection In Patients Visiting Government Dental College & Hospital Srinagar For Dental Treatment

Zeenat Shah<sup>1</sup>, Suheel Hamid Latoo<sup>2</sup>, Afreen Nadaf<sup>3</sup>, Sonia Gupta<sup>4</sup>

<sup>1</sup>Postgraduate Scholar, <sup>2</sup>Professor & Head, <sup>3</sup>Assistant Professor, <sup>4</sup>Tutor,

Department of Oral Pathology & Microbiology. Govt. Dental College & Hospital, Srinagar. J&K- UT

**\*Corresponding Author:**

**Dr. Zeenat Shah**

Postgraduate scholar, Department of Oral Pathology & Microbiology. Govt. Dental College & Hospital, Srinagar. J&K- UT 190010

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

### Abstract

**Introduction:** COVID 19 is an ongoing global pandemic disease caused due to severe acute respiratory syndrome coronavirus -2 (SARS-2). The virus spreads primarily via nose and mouth secretions including small droplets produced by coughing, sneezing, and talking. Common symptoms include fever, cough, fatigue, shortness of breath, and loss of smell and taste.

**Aim:** The aim of the present study was to determine prevalence of COVID 19 infection among patients visiting Government Dental College and Hospital for treatment and correlating with age, gender, contact with positive patient, relation with health care worker and with underlying medical condition.

**Materials and methods:** A data for the study was retrieved from Department of Oral Pathology, Govt Dental College & Hospital Srinagar who reported to the hospital for treatment for a period of 1 year and were screened for COVID-19.

**Conclusion:** This study will be useful to determine the early identification of the disease and subsequent intervention to reduce morbidity and mortality.

**Keywords:** NIL

### Introduction

Coronavirus disease 2019 also popularly known as COVID 19. It is a viral disease caused by newly emerged coronavirus, SARS-CoV-2. The first case was diagnosed in Wuhan, Hubei province of China in December 2019 and within shorter period of time has become pandemic throughout the world.<sup>1</sup> From last twenty years several viral epidemics have been recorded such as in 2002-2003 severe acute respiratory syndrome corona virus (SARS CoV), H1N1 influenza in 2009 and most recently Middle East respiratory syndrome coronavirus (MERS-CoV) in 2012 which was identified in Saudi Arabia.<sup>2</sup> Initially the main mechanism considered to be involved in this disease was from animals to humans but the important means of transmission that has been

realized now is from infected symptomatic or asymptomatic individuals via respiratory infected droplets through coughing, sneezing or when a patient speaks loudly.<sup>3</sup>

2019 novel coronavirus is a positive-sense, single-stranded RNA viruses that belongs to the Nidovirales order. These viruses have spike like glycoprotein on their envelope. Under electron microscope these spikes give them crown like appearance (*coronam* latin term for crown) structurally indistinct from SARS CoV and MERS CoV which are member of beta- coronavirusidae.<sup>2,3</sup>

The initial cases were presumably linked to direct exposure to infected animals (animal-to human transmission) at a seafood market in Wuhan, China.

The most common source of infection is symptomatic people. Transmission occurs from the spread of respiratory droplets through coughing or sneezing.<sup>3</sup> The mean incubation period before clinical signs are evident is 6.4 days. Fever, cough, fatigue are most common symptoms. Most of the cases show mild symptoms but, in few cases, there may be spontaneous progression over week. Other less common symptoms are dyspnea, diarrhea, dizziness, nausea and vomiting.<sup>4</sup> In severe condition there might be respiratory failure that requires mechanical ventilation and intensive care units, chest CT showing feature of pneumonia with abnormal findings. There might also be multiorgan failure manifesting systemically as sepsis, septic shock and multiorgan disorder.<sup>2</sup>

With the outbreak of the coronavirus pandemic most of the healthcare services were restricted to emergency treatment only including dental treatment also. Dental profession is considered highly contagious for COVID 19 as it involves procedures where the patient and the dentist are in close contact and are often exposed to body fluids such as blood and saliva of the patients, and in some cases, high-speed cutting and piercing tools are used.<sup>1,5</sup> The various instruments such as high speed devices that are cooled by water generates aerosols in extensive amount contaminated by patients blood and saliva.<sup>5</sup> The surfaces and instruments contaminated by blood, saliva and aerosols poses risk to dental professionals as well as those who visit for treatment.<sup>6</sup> During pandemic, dental treatment is considered as one of the risky treatment based on these considerations.<sup>5</sup>

The aim of the present study was to determine prevalence of COVID 19 infection among patients visiting Government Dental College and Hospital for treatment and correlating with age, gender, contact with positive patient, relation with health care worker and with underlying medical condition.

### Method and Methodology

A study was conducted in the Post Graduate Department of Oral and Maxillofacial Pathology and Microbiology of Government Dental College &

Hospital, Srinagar from July 2020-2021, among patients who came to the hospital for dental treatment or were undergoing dental treatment/procedure. The data that was collected included age, gender, travel history, symptoms, contact with positive cases, whether a health care worker and underlying medical condition. From these patient's nasopharyngeal sample and were collected for COVID-19 screening. The sample were sent to Govt. Chest Disease Hospital Dalgate Srinagar which is an associated hospital of Government Medical College Srinagar. The technique used for screening was RT-PCR. Total number of cases were 8000. The data was then retrieved from Post Graduate Department of Oral and Maxillofacial Pathology and Microbiology of Government Dental College & Hospital, Srinagar. The entire data was recorded on an MS excel sheet and was sent for stastiscal analysis, to compare and correlate these data, to formulate the results based on above parameters.

### Statistical analysis

Statistical analysis was carried out with an aim to compare prevalence of COVID 19 infection based on age, gender, with or without symptoms, with or without travel history and also among health care workers and patients with underlying medical condition.

### Results:

The data of 8000 patients was retrieved from Postgraduate Department of Oral and Maxillofacial Pathology. Different age groups were made out of which 1334 were less than of 20 years of age, positivity rate was 2.70%, 4247 were between the age group of 20-39 and positivity was 4.77%, 1854 individuals were between the age group of 40-59 years positivity rate was 7% and positivity rate among individual who were more or equal to 60 years i.e., total of 565 patients, positivity rate was 7.26%. Total positive rate was 5.24%. So, from this data it is evident that the individual who were in the age group of 40-60 years or more were showing slightly more positivity than others. (Table 1) .

**Table 1 Prevalence of COVID 19 among different age groups**

AGE	Positive	Negative	Total (n)
<20	36 (2.70)	1,298 (97.30)	1,334 (100.00)
20-39	212 (4.77)	4035 (95.23)	4247 (100.00)
40-59	130 (7)	1724 (93)	1,854 (100.00)
≥60	41 (7.26)	524 (92.74)	565 (100.00)
<b>Total</b>	419 (5.24)	7581 (94.76)	8000 (100.00)

Among 8000 patients the number of males who visited the hospital were more in number i.e. 4175 than females i.e. 3825. The overall COVID 19 positivity rate among males and females was found to be 4.64%. It was found to be slightly higher among males with a positive rate of 5.12% than females with positive rate of 4.10%. (Table 2)

**Table 2 Prevalence of COVID 19 among males & females.**

Gender	Positive	Negative	Total (n)
Female	157 (4.10)	3,668 (95.89)	3,825 (100.00)
Male	214 (5.12)	3,961 (94.87)	4,175 (100.00)
<b>Total</b>	371 (4.64)	7,629 (95.36)	8000 (100.00)

Most of the patients who visited for treatment were not having any travel history outside state or country. Among total of 8000 patients only 20 were having interstate travel history and out of these 7 (35%) were COVID 19 positive while as 13(65%) were COVID 19 negative. (Table 3)

**Table 3 Prevalence of COVID 19 among patients with travel history.**

Travel history	Positive	Negative	Total (n)
Yes	7 (35)	13 (65)	20 (100.00)
No	366 (4.58)	7,614 (95.41)	7,980 (100.00)
<b>Total</b>	373 (4.66)	7,627 (95.34)	8000 (100.00)

Total of symptomatic patients out of 8000 patients were 62 out of which only 12 (19.35%) were COVID 19 positive and 50 (80.64%) were negative. (Table 4)

**Table 4 Prevalence of COVID 19 among patients with symptoms.**

Symptoms	Positive	Negative	Total (n)
Yes	12 (19.35)	50 (80.64)	62 (100.00)
No	357 (4.50)	7,581 (95.50)	7,938 (100.00)
Total	369 (4.61)	7,631 (95.39)	8000 (100.00)

Total individual and having contact with positive case were 178 out of which only 23 (12.92%) were COVID 19 positive and 155 (87.08%) were COVID 19 negative.

**Table 5 Prevalence of COVID 19 among individuals with contact with positive case.**

Contact with positive case	Positive	Negative	Total (n)
Yes	23 (12.92)	155 (87.08)	178 (100.00)
No	346 (4.42)	7,476 (95.57)	7,822 (100.00)
Total	369 (4.61)	7631 (95.38)	8000 (100.00)

The 195 health care workers who were screened for COVID 19 only 19 (9.74%) were COVID- 19 positive while as 176 (90.26%) were COVID-19 negative. (Table 6)

**Table 5 Prevalence of COVID 19 among health care worker.**

Health care worker	Positive	Negative	Total (n)
Yes	19 (9.74)	176 (90.26)	195 (100.00)
No	350 (4.48)	7,455 (93.18)	7,805 (100.00)
Total	369 (4.61)	7,631 (95.38)	8000 (100.00)

Out of 8000 patients 106 were having underlying medical condition and only 7 (6.60%) were COVID 19 positive while as 99 (93.4%) were COVID 19 negative.

**Table 6 Prevalence of COVID 19 among patients with underlying medical conditions.**

Underlying medical condition	Positive	Negative	Total (n)
Yes	7 (6.60)	99 (93.4)	106 (100.00)
No	362 (4.58)	7,532 (95.41)	7,894 (100.00)
Total	369 (4.61)	7,631 (95.40)	8000 (100.00)

## Discussion

Coronavirus disease (COVID 19) a viral disease has become a serious issue to the public health. This virus which is highly contagious has spread globally since its outbreak.<sup>6</sup> It was declared as public health emergency of international concern on 30 January 2020.<sup>3</sup> Originally Coronavirus was zoonotic infection found in avian and mammalian species.<sup>7</sup> Human pathogenic type of Coronaviruses are associated with mild symptoms.<sup>8</sup> This infection results in common cold in 20% of cases except in severe acute respiratory syndrome related coronavirus (SARS CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV).<sup>7,8</sup> MERS-CoV was first detected in 2012 in Saudi Arabia.<sup>8</sup>

SARS-CoV-2 belongs to beta CoVs category.<sup>2</sup> They are enveloped, icosahedral, symmetrical particles approximately of size 60-140 nm, with spike-like projections on their membranes that give them the shape of crown ("Corona" in Latin) and hence the name coronavirus.<sup>2,7</sup>

Transmission of infection occurs by infected symptomatic or asymptomatic persons through droplets or direct contact.<sup>4</sup> Transmission from person-person is thought to occur from the spread of respiratory droplets through coughing or sneezing among close contacts.<sup>9</sup> The Incubation period varies between 3 and 14 days with mean incubation period of 6.4 days.<sup>4,10</sup> After exposure patients may manifest wide range of symptoms ranging from asymptomatic patients, to septic shock and multiorgan failure.<sup>8</sup> The most common symptoms that a patient may exhibit are night fever, dry cough, sore throat and asthenia, in severe cases patients also present with dyspnea. 15-25% of infected cases may present with

respiratory failure that leads to hospitalization and assisted ventilation.<sup>10</sup>

The main transmission pathway that involves respiratory system are droplets or fomites during interpersonal contact, coughing, sneezing or even talking.<sup>11</sup> The pathogenic organisms derived from oral cavity and airways have always been a risk factor for cross infection among dentists and para dental staff.<sup>10</sup> The equipment used during dental treatment such as dental high-speed turbine, spray handpiece, or piezoelectric scaler largely generates aerosols and are found within 60cm from the patients head, found on right arm of dentists, masks and around their eyes and nose.<sup>10,12</sup> Based on these consideration dental procedures are considered as one of the cause of SARS-CoV-2 spread as these procedures require close proximity to patients mouth, direct contact with patients saliva, blood or other biological fluids and use of instruments that creates large aerosols that could land on exposed surfaces resulting in infection.<sup>10</sup>

The aim of the present study was to determine prevalence of the individuals who are at increased risk for COVID 19 or individuals with less severe symptoms for disease and also to determine the correlation with age, gender, symptoms, travel history, health care worker and underlying medical condition.

In the present study the prevalence of COVID 19 infection was found slightly higher among age group of 40-59 (7%) years and those who were  $\geq 60$  (7.26%) years, lower infectivity rate was noted among  $\leq 20$  (2.70%) years age group with slightly male predominance which was found to be (5.12%). So most of the individuals who were at higher risk were adults or elder persons with less incidence among

children and young adults. Reduced incidence among children is attributed to the reduced expression of angiotensin-converting enzyme 2 (ACE-2) in their nasal epithelium. These results simulate with the study conducted by Jakhmola S, Baral B, Jha HC in 2021 that reported the individuals with age group of 20-49 years of age and 50 years-above were highly vulnerable to infection.<sup>11</sup>

Of total, 19.35% of symptomatic patients who were screened for COVID 19 RTPCR, were diagnosed positive for disease. The results were in accordance with the reported findings of L. Jacob, A. Koyanagi, L. Smith et al in 2021. They reported the individuals who were symptomatic and tested for COVID 19 were positive for COVID 19. So, follow up of COVID 19 patient is important to avoid any potential delay in the referral of those with severe COVID-19 symptoms to emergency department.<sup>12</sup>

The prevalence of COVID 19 among health care works were found to be lower in the present study. It was seen that health care workers who tested positive for infection were 19 (9.74%) of total 195 and finding were in accordance with the study of Jeremias A. et al in 2020. Even though exposure to infection in hospital premises are higher than general public, the current use of PPE practice has eased this burden among health care workers.<sup>13</sup>

The prevalence of COVID 19 among patients with underlying medical condition were found to be low. Total patients who were having the underlying medical condition were found to be 106 and total positivity rate was only 6.6% finding were in accordance with Jacob, A. Koyanagi, L. Smith et al in 2021.<sup>12</sup>

### Conclusion:

Coronavirus disease is caused by SARS CoV-2 is a highly contagious disease that had its impact globally and continues to spread with an unpredictable trajectory. The pandemic has affected every facet of life with an unprecedented impact. Transmission is found to be mainly from human to human among close contacts via respiratory droplets which are produced during coughing or sneezing. There is also a potential risk of spread of COVID 19 infection during dental treatment or surgery due to contaminated dental fluids, saliva, or aerosol spread or by contaminated instruments and surface.

Therefore, following the all the preventive measures and guidelines could help in curtailment of infection.

### References:

1. Villani FA, Aiuto R, Paglia L, Re D. COVID-19 and Dentistry: Prevention in Dental Practice, a Literature Review. *Int. J. Environ. Res. Public Health* 2020, 17.
2. Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Napoli RD. Features, Evaluation and Treatment Coronavirus (COVID-19).
3. Bhanushali P, Katge F, Deshpande S, Chimata V, Shetty S, Pradhan D. COVID-19: Changing Trends and Its Impact on Future of Dentistry. *Int. J, Dent.* 2020;2020:6.
4. Chen Y, Liu Q, Guo D. Emerging coronaviruses: Genome structure, replication, and pathogenesis. *J Med Virol.* 2020;92:418–423.
5. Checchi et al. COVID-19 dentistry-related aspects: a literature overview. *Int. J, Dent.* 2020:1-6.
6. H. Harapan et al. Coronavirus disease 2019 (COVID-19): A literature review. *Journal of Infection and Public Health.* 13(2020):667-673.
7. Cascella M, Rajnik M, Cuomo A, Dulebohn SC, Napoli RD. Features, Evaluation and Treatment Coronavirus (COVID-19). 2020.
8. Bal A, Agrawal R, Vaideeswar P, Arava S, Jain A. COVID-19: An up-to-date review – from morphology to pathogenesis. *Indian J Pathol Microbiol* 2020;63:358-66.
9. Kooshkaki et al. COVID-19: Novel Management Approaches and Treatments. 2020;10:1-17.
10. Çelik OE, Canseve IH. Evaluation of the effects of the COVID-19 pandemic on dentistry. *Clin Exp Dent Res.* 2021;1–8.
11. Jakhmola et al. A comparative analysis of COVID-19 outbreak on age groups and both the sexes of population from India and other countries. *J Infect Dev Ctries* 2021; 15(3):333-341.
12. Jacob, A. Koyanagi, L. Smith et al. Prevalence of and factors associated with COVID-19 diagnosis in symptomatic patients followed in general practices in Germany between March 2020 and

March 2021. International Journal of Infectious Diseases 111 (2021) 37–42.

Tertiary Community Hospital. JAMA Intern Med. 2020;180(12):1707-1709.

13. Jeremias A. *et al*. Prevalence of SARS-CoV-2 Infection Among Health Care Workers in a