

**Novel Coronavirus: An Emerging and Re-Emerging Outbreak – A Questionnaire Survey Update from the Dentists across J&K Region.**

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**Abstract**

A severe respiratory illness was recently reported in Wuhan, Hubei province, China. As of 25 January 2020, at least 1,975 cases had been reported since the first patient was hospitalized on 12 December 2019. Epidemiological investigations have suggested that the outbreak was related to a seafood market in Wuhan. Emerging infectious diseases, such as severe acute respiratory syndrome (SARS) and Zika virus disease, presented a

major threat to public health. Despite of intense efforts about how, when and where this disease appeared is still a source of considerable uncertainty. Little is known about the effectiveness of personal protective equipment for health care workers who take care of patients infected with the novel Coronavirus which has spread globally. According to current evidence, COVID-19 virus is primarily transmitted between people through respiratory droplets and get in touch with routes. Droplet transmission

occurs when an individual is in close contact (within 1m) with someone who has respiratory symptoms (e.g., coughing or sneezing) and is therefore in danger of getting his/her mucosa (mouth and nose) or conjunctiva (eyes) exposed to potentially infective respiratory droplets. Taking this into account, dentists are at highest risk for exposure to this virus since we work in close proximity to the patient's oral cavity. Saliva and aerosols along with splatter have a huge role in spreading this virus. Thus the aim of our study is to assess the knowledge and awareness of 600 dental surgeons regarding COVID 19 in the Jammu and Kashmir region. Infection control measures are necessarily to be taken for preventing the disease from further spread in order to control its pandemic virulence.

**Keywords:** Covid 19, Dentistry, Severe Acute Respiratory Syndrome, Prevention, Pandemic.

### Introduction

The severe acute respiratory syndrome coronavirus and recently emerged Middle-east respiratory syndrome coronavirus epidemics have proven the ability of virus to cross species barrier and emerge rapidly among humans. The SARS epidemic in 2003 has awakened the scientists on its ability to transmit infection from animals (intermediate host referring to horseshoe bats as a reservoir)<sup>1, 2</sup> to humans infecting 1,755 people with 299 deaths. On 23 september, 2012 WHO announced the discovery of a new coronavirus, MERS-CoV detected in two patients who died from mysterious rapidly fatal disease in middle east<sup>3</sup> having a higher mortality rate (>35%) than SARS (9.6%).<sup>4</sup>

Coronaviruses, a genus of the Coronaviridae family, are enveloped viruses with a large plus-stranded RNA genome known to cause illness ranging from common cold to more severe disease<sup>5</sup>. The RNA genomic is 27–32 kb in size which is capped and polyadenylated. These viruses distributed in mammals are enveloped, non-

segmented positive sense RNA and belongs to sub family orthocoronavirinae, order Nidovirales<sup>6,7</sup>. Coronavirus have been identified in mice, rats, chickens, turkeys, swine, dogs, cats, rabbits, horses, cattle and humans, and can cause a variety of severe diseases including gastroenteritis and respiratory tract diseases. Three recently identified SARS-CoV causes a life-threatening pneumonia, and is the most pathogenic human coronavirus identified so far. SARS-CoV is likely to reside in an animal reservoir, and has recently initiated the epidemic in humans through zoonotic transmission.

Coronavirus was initially isolated from an elderly person in 2012<sup>8</sup>. Symptomatic patients have been the main source of transmission whereas, asymptomatic patients and patients in the incubation period are as carriers<sup>9</sup>. Clinically, affected individuals may be asymptomatic or suffering from severe pneumonia, acute respiratory distress syndrome, septic shock, and multi-organ failure, leading to death<sup>10</sup>. The virus is believed to spread via airborne transmission. In addition, studies have shown that respiratory viruses can also be transmitted directly or indirectly through saliva, as salivary glands are found to be the reservoirs<sup>11</sup> for some of its strains have been detected in saliva as long as 29 days after infection<sup>12</sup>. Hence, healthcare workers particularly the dental professionals are at more risk since the virus may be transmitted to operators from infected patients through aerosols. Considering that numerous kinds of dental equipments that are used in the clinical practice in the form of handpieces, air-water syringes and ultrasonic scalers considerable amounts of aerosols are produced. Thus, the potential for the spread of infections from patients to dentists or dental assistants is high.

Scully and Samaranayake emphasized on the fact that equal importance should be given to infection control in dental as with the understanding of oral manifestations

and the diagnosis and management of viral infections<sup>13</sup>. Effective infection control measures for the prevention or minimization of viral infection transmission should be implemented in clinical practice. Orthopantomographs or oblique lateral views could also be considered rather than intraoral radiographs for screening. Sedation may also be considered to control gag reflex symptoms.

A pre-operational antimicrobial mouthrinse is generally used by many practitioners to reduce the number of oral microbes. However, the National Health Commission of the People's Republic of China advocated that chlorhexidine, which is commonly used as mouthrinse in dental practice, may not be effective to kill corona virus. Since corona virus is vulnerable to oxidation, preprocedural mouthrinse containing oxidative agents such as 1% hydrogen peroxide or 0.2% povidone is recommended, for the purpose of reducing the salivary load of oral microbes<sup>14</sup>.

COVID-19 has more respiratory symptoms than cold, which usually causes a runny nose, congestion, and sneezing. Other clinical symptoms of the affected individuals include fever, cough, chills, throat soreness, myalgia, arthralgia, vomiting, or diarrhea, reduced sense of smell and abnormal taste sensation has also been reported.<sup>15, 16</sup> About 80% of people recover from the symptoms of COVID-19 without needing any special medical treatment. However, older adults and people with compromised immune systems are at the highest risk of developing more severe disease.

Real-time reverse transcription polymerase chain reaction (RT-PCR) is the most popular testing method for the detection of COVID-19. Antibody-based immunoassay

techniques combined with different signal detection methods are also found to be typically rapid detection methods. Use of the programmable RNA sensors is another promising approach for RNA virus detection<sup>17</sup>

Chest computed tomography showed bilateral pneumonia, with ground-glass opacity and bilateral patchy shadows<sup>18</sup>.

The current reported mortality death rate is 2-3% and at the moment there is no cure to the disease<sup>19</sup>, but the drugs that are known figure against some viruses are being trialled in China, where there are thousands of patients, and new trials are starting within the US and other countries. The ideal ones are Kaletra, which in turn is the combination of two anti-HIV drugs, and remdesivir, which was tried in Ebola patients in West Africa in 2013 and 2016 but failed. Chinese doctors also are trying chloroquine, an antimalarial, which is off-patent, therefore cheap and highly available, and can be useful in low-income countries.

Due to its widespread transmission and reports of its spread to health care providers, it is more contagious than SARS-CoV and MERS-CoV<sup>20</sup>. Dental professionals are also at the high risk of nosocomial infections and can become the potential carrier of disease<sup>21</sup>. The dental team should be aware of the health protection against virus and should follow strict infection controls setup measures<sup>22</sup>.

### **Material And Methodology**

A web based questionnaire survey was conducted among the randomly selected 599 dental surgeons of Jammu and Kashmir. Data was collected using <http://surveyheart.com/form> software. The questionnaire was introduced to said sample through the emails and individual telephone numbers. The final data was collected and analysed statistically using SPSS software.

**Results**

Table 1: Questionnaire

S.No	Question	Frequency			Total(N)
		Yes	No	Unknown	
1.	Were You Aware About The Coronavirus Before Its Outbreak?	N=168 28.0%	N=428 71.3%	N=4 0.7%	600 100%
2.	Do You Know About Its Mode Of Transmission?	N=575 95.8%	N=25 4.2%	-	600 100%
3.	Are The Symptoms Of Covid Similar To Flu?	N=475 79.2%	N=117 19.5%	N=8 1.3%	600 100%
4.	Can Covid Be Transmitted From Animals/Pets To Humans?	N=237 39.5%	N=363 60.5%	-	600 100%
5.	Is There Any Relationship Between Covid19 And Dentistry?	N=489 81.5%	N=103 17.2%	N=8 1.3%	600 100%
6.	Do You Know Anything About The Aerosol Protection Units Available?	N=408 68.0%	N=192 32%	-	600 100%
7.	Can A Dental Health Professional Be A Front Line Saviour?	N=476 79.3%	N=124 20.7%	-	600 100%
8.	Does Dental Practice Should Be Stopped Due To The Danger Of Covid19?	N=264 44.0%	N=336 56.0%	-	600 100%
9.	Is There Any Treatment Of Covid19?	N=98 16.3%	N=502 83.7%	-	600 100%

S.No	Question	Frequency				Total(N)
		1-14days	14-21 Days	21-28 Days	Unknown	
		N=455	N=71	N=81	N=3	600
10	Incubation Period Of Covid 19	74.17%	11.83%	13.5%	0.5%	100%

S.No	Question	Frequency				Total(N)
		Lungs	Lungs And Kidney	Others	No Answer	
		N=504	N=37	N=53	N=1	600
11	Which Organs Are Mostly Affected	84%	6.1%	8.9%	1%	100%

S.No	Question	Frequency					Total(N)
		Elderly N=134	Elderly+Immunocompromised N=332	Elderly+Children N=67	Others N=62	Unknown N=5	600
12	Which Group Of People Is Most Susceptible To The Diseases?	22.43%	55.43%	11.17%	10.3%	0.8%	100%

S.No	Question	Frequency			Total(N)
		Dentist N=182	Health Care Professional N=384	Others N=34	600
13	Which Is The Most Affected Profession By Covid19?	30.3%	64%	5.7%	100%

S.No	Question	Frequency						Total(N)
		Financial Loss N=106	Decrease In Treatment N=199	Only Emergency Treatment N=45	Risk Of Infection N=145	Follow Guideline N=37	Unknown N=68	600
14	What Are The Consequences Of Dental Practice After Covid19?	17.7	33.17	7.5	24.17	6.17	11.3	100%

S.No	Question	Frequency				Total(N)
		Fungus N=0	Bacteria N=8	Virus N=592	Protozoa N=0	600
15	Which Class Does Covid19 Belong?	-	1.3%	98.3%	-	100%

S.No	Question	Frequency			Total(N)
			DNA N=109	RNA N=491	600
16	Covid 19 Is?	18.2%	81.8%	100%	

S.No	Question	Frequency					Total(N)
		1 N=0	2 N=62	3 N=116	4 N=420	Not Known N=2	600
17	How Many Stages Are There For Covid19 Transmission?	-	10.3%	19.3%	70%	0.3%	100%

S.No	Question	Frequency				Total(N)
		2-3% N=360	5-10% N=189	10-20% N=26	Unknown N=25	600
18	What Is The Mortality Rate?	60%	31.5%	4.3%	4.2%	100%

S.No	Question	Frequency				Total(N)
		Sars And Mers N=509	Ebola N=70	Salmonella N=11	Not Known N=10	600
19	What Are The Previous Strains Known?	84.8%	11.7%	1.8%	1.7%	100%

S.No	Question	Frequency				Total(N)
		5 N=278	6 N=54	7 N=232	Unknown N=36	600
20	How Many Other Strains Of Corona Virus Are Known?	46.3%	9%	38.7%	6%	100%

S.No	Question	Frequency			Total(N)
		Pandemic N=153	Epidemic N=443	Unknown N=4	600
21	Were The Earlier Strains Pandemic And Epidemic	25.5%	73.8%	0.7%	100%

S.No	Question	Frequency			Total(N)
		24 Hours N=198	48 Hours N=134	72 Hours N=268	
22	How Many Hours Does The Coronavirus Persist On The Surface?	33%	22.3%	44.7%	100%

S.No	Question	Frequency		Total(N)
		Reject The Patient N=145	Treat Patient With Minimal Aerosol N=455	
23	If A Covid19 Positive Patient Visits You With A Dental Emergency What Will You Do?	24.2%	75.8%	100%

S.No	Question	Frequency			Total(N)
		1 Week And 2-3 Weeks N=47	2 Weeks And 3-4 Weeks N=326	3 Weeks And 4-5 Weeks N=227	
24	Recovery Time For Mild And Severe Cases Of Covid 19?	7.8%	54.3%	37.8%	100%

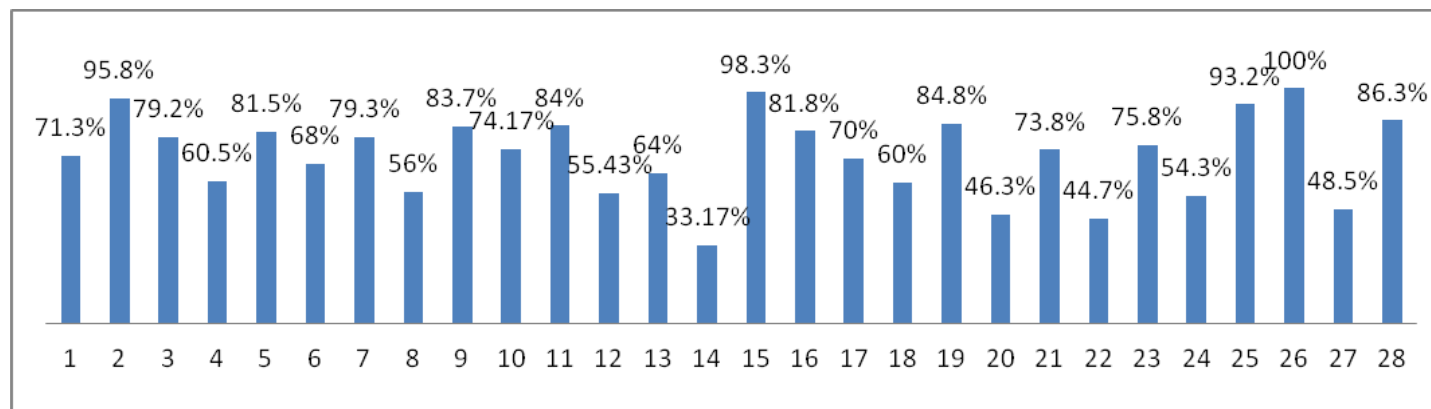
S.No	Question	Frequency				Total(N)
		No Human Contact N=0	Maintaining Social Distancing N=28	Taking Protective Measures N=13	All N=559	
25	How Can It Be Prevented?	-	4.7%	2.2%	93.2%	100%

S.No	Question	Frequency			Total(N)
		China N=600	Canada N=0	Cuba N0=	
26	Which Is The First Place Of Outbreak?	100%	-	-	100%

S.No	Question	Frequency				Total(N)
		Salivary Glands N=154	Throat N=147	Lungs N=291	Unknown N=8	600
27	Any Reservoir Of Covid In Human Body?	25.7%	24.5%	48.5%	1.3	100%

S.No	Question	Frequency					Total(N)
		Minimum Aerosol Production N=42	Proper Fumigation N=24	High Vacuum Suction N=8	All N=518	Unknown N=8	600
28	How Can It Be Protected In A Dental Clinic?	7%	4%	1.3%	86.3%	1.3%	100%

Figure 1



**Discussion**

Track infectious diseases a trend may be a paramount work to alert the international community to the occurrence of cases round the world including the identification of latest foci of infection<sup>23</sup>. The three highly pathogenic viruses ( SARS- CoV, MERS- CoV and 2019-nCoV) cause severe respiratory syndrome in humans and the other four human corona virus ( HCoV-NL63, HCoV-229E, HCoV-OC43 and HCoV-HKU1) induce only mild

upper respiratory diseases in immune competent patients hosts, although many of them can cause severe infections in infants, young children and elderly individuals<sup>24</sup>. The present survey concluded that around 84.8 %, 38.7 % and 73.8% of subjects were fully aware and had the proper knowledge about the previous strains, number of stains and about its outbreak.

Pro MED proved to be useful source of information about the virus, only 28% of subjects knew about the



coronavirus before its outbreak. It was evident that it gave a misleading impression of the distribution and mortality in some areas as has been previously reported for other infections<sup>25</sup>.

While the trajectory of this outbreak is impossible to predict, effective response requires prompt action from the standpoint of classic public health strategies to the timely development and implementation of effective counter measures. The emergence of yet another outbreak of human disease caused by a pathogen from a RNA viral family (81.8 %, 98.7%) formerly thought to be relatively benign underscores the perpetual challenge of emerging infectious diseases and the importance of sustained preparedness<sup>26</sup>

It is imperative that animal reservoirs that transmitted the COVID 19, to humans should be identified as quickly as possible to aid in the control of disease. It is thus, urgent that the results of the animal testing from sea food market in Wuhan be released as soon as possible<sup>27</sup>.

There are four stages of transmission of virus: the first stage is the appearance of the disease which means the disease is just introduced and the positive cases begins to emerge for the very first time. This stage is followed by the stage of local transmission in which the virus spreads locally and can be monitored by contact tracing, isolating people with symptoms, strict screening measures, social distancing, and lockdown efforts. According to the Indian Council of Medical Research (ICMR), India is currently in this stage of the novel coronavirus transmission. The third stage is the community transmission in which it is difficult to trace the source of infection spread; once the community transmission begins it becomes difficult to contain the disease and to stop the chain of transmission. The fourth and the last stage is the wide spread outbreak in which the number of cases and deaths begin rapidly multiplying, with no end in sight<sup>30</sup>. About 95.8 % and 70% of subjects

were aware about the mode and stages of transmission respectively<sup>28</sup>.

According to recent report, more than 97 percent of people who contract SARS-CoV-2 show symptoms within 11.5 days of exposure. The average time period seems to be around 5 days. There are various choices one can make about the parametric form of the incubation period distribution, but it is prudent not to dismiss the possibility of incubation periods up to 14 days at this stage of the pandemic and 71.47 % age of subjects were aware about the same<sup>29</sup>.

The online world wide data till 26 April dated shows 2,931,922 corona virus cases with 838,883 recovered and 203,596 deaths. The active cases are 1,889,443 (serious cases= 57,835(3%) and mild cases=1,831,608(97%)) and the closed cases include (recovered =838,883( 80%) and 203,596(20%) deaths). Hence, proved the mortality rate to be around 2-3 % and 60 % age of subjects included in the study agreed with it<sup>30</sup>.

Current observations suggest that people of all ages are generally susceptible to this new infectious disease. Its previous stains are zoonotic in nature and 60.5 % of subjects also consider COVID 19 to be zoonotic. However, those who are in close contact with patients with symptomatic and asymptomatic COVID-19, including health care workers, other patients in the hospital, and elderly people with pre-existing medical conditions are at higher risk of SARS-CoV-2 infection. The signs and symptoms of COVID 19 were found not to be similar to seasonal flu and about 79.2 % of people knew about it<sup>31</sup>.

Kohn et al. 2003 suggested that infections can occur through the puncture of sharp instruments or direct contact between mucous membranes and contaminated hands so it is better that dentists should take strict personal protection measures and avoid or minimize operations that can produce droplets or aerosols, 68% of subjects were fully

aware about the minimum aerosol production protocol<sup>32</sup>. The 4-handed technique is better for controlling infection<sup>9</sup> for which 79.3 % of subjects considers dental health profession as a front line saviour for reducing the risk of infection. Thus, effective infection control measures for the prevention or minimization of viral infection transmission should be implemented in clinical practice. The use of rubber dams can significantly minimize the production of saliva and blood- contaminated aerosol or spatter, particularly in clinical situations where high-speed handpieces and dental ultrasonic devices are used<sup>33</sup>. High-speed dental handpiece without anti- retraction valves generally aspirate and expel the debris and fluids during the dental procedures. The microbes, including bacteria and virus, may further contaminate the air and water tubes within the dental unit, and thus can potentially cause cross-infection<sup>34</sup>. Private practitioners as well as subjects running single dental units were fully aware about the use of high vacuum suction making an appropriate amount of 56% who were also in favour of continuing the dental practice with proper protection measures (86.3 %), as the pandemic gets over.

Medical researchers are starting various measures for treatment of COVID 19 using its previous strains (SARS, MERS) as prototypes. For example, platform diagnostic modalities are being rapidly adapted to incorporate COVID 19, allowing early recognition and isolation of cases. Broad-spectrum antivirals, such as remdesivir, an RNA polymerase inhibitor, as well as lopinavir/ritonavir and interferon beta have shown promise against MERS-CoV in animal models and are being assessed for activity against 2019-nCoV<sup>26</sup>, yet there is no exact treatment/vaccination available for the diseases and 83.7% of subjects knew about it.

Since the beginning of the COVID-19 outbreak, and in alignment with available evidence, WHO maintains the

advise, within the context of droplet and get in touch with precautions for the utilization of medical masks for normal care of COVID-19 patients and respirators (N95, FFP2 or FFP3) for circumstances and settings where aerosol generating procedures are performed. It also continues to recommend that everybody performs hand hygiene frequently, follows respiratory etiquette recommendations and frequently clean and disinfect surfaces because the virus survives on the plastic and stainless steel for 3 days and 44.7 % of subjects agreed with it., the importance of maintaining physical distances and avoiding people with fever or respiratory symptoms. These preventive measures will limit viral transmission<sup>35</sup> and without the ability to prevent community infection, prevention of health care transmission will remain a challenge.

### Conclusion

Since the number of COVID 19 cases may increase in future with less knowledge about the treatment and vaccination procedures, dental professionals should be well informed and much educated about the signs and symptoms of the disease including the stringent infection control measures. Clinical scenario with the abilities to prevent community infection and considering the knowledge about the working environment of dental professionals, it is unique in a way because it requires a close operatory and maximum patient contact. Early recognition and control of the source, application of simple precautions for all patients, extra precautions for COVID positive cases, administrative and environmental controls are the various guidelines for the infection, prevention and control (IPC). Thus, it makes an important note for informed clinical decisions and educate the public and professionals to prevent panic while promoting health. Numerous clinical trials including convalescent plasma therapy and ChAdOx1 nCoV-19 are being performed to validate the safety of patient but with fewer outcomes. The

above survey included the knowledge and awareness of dental professionals from the Union Territory of Jammu Kashmir and further more studies need to be conducted throughout INDIA.

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