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Review Article

COVID-19 & Dentistry- A Review

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ABSTRACT
COVID-19 is the latest infectious disease which has shaken the world. Dentists are more prone to get infected through droplets of saliva or discharge from the nose when an infected person coughs or sneezes. There are no prophylactic vaccines for COVID-19. Thus to prevent such Pandemic disease follow of strict guidelines is essential. The present review article highlighted the COVID-19 infection and its impact on dentistry.
Key words: COVID-19, Dentists, Pandemic.

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Introduction

COVID-19 is the latest infectious disease to rapidly develop worldwide. COVID-19 was first discovered in Wuhan, China in 2019 unfortunately spreading internationally, resulting in the 2019–2020 pandemic. World Health Organization (WHO) and the Public Health Emergency of International Concern (PHEIC) declared it as pandemic disease of 2019-2020.[1]

COVID-19 has as its etiologic agent the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The present coronavirus is different from SARS-CoV, but it has the same host receptor: human angiotensin-converting enzyme 2 (ACE2). These viruses are common in animals with the potential of transmission to humans.[2] They are composed of an envelope, a lipid layer, and single-stranded large RNA.

The name "corona" ("crown" in latin) is attributed to the spherical shape and surface projections. Four subfamilies have been identified: alpha-, beta-, gamma-, and delta-coronaviruses.[3] Beta-coronaviruses seem to originate from mammals, namely bats; it was found that the genome sequence of SARS-CoV-2, the virus responsible for COVID-19, is >90% identical to a bat coronavirus RaTG13. In fact, bats represent a natural reservoir for a wide variety of coronaviruses including SARS-CoV-like and MERS-CoV-like viruses. SARS-CoV-2 is closely related to the SARS-CoV virus, and it belongs to the B lineage of the beta-coronaviruses, which are known to cause severe disease and fatalities.[4]

Epidemiology

There have been 426914 cases reported till date. Out of which, 175992 are active, 237214 cured/ migrated and 13708 died.[5]

CORONAVIRUS COVID-19 in India[5]

Total Cases Tally in India Coronavirus COVID19	**426914**	**175992**	**13708**	**237214**
State Wise Breakdown	**Total Cases**	**Active Cases**	**Deaths**	**Cured/ Migrated**
Maharashtra	132075	60161	6170	65744
Delhi	59746	24558	2175	33013
Tamil Nadu	59377	25866	757	32754
Gujarat	27317	6296	1664	19357
Uttar Pradesh	17731	6186	550	10995
Rajasthan	14930	2984	349	11597
West Bengal*	13945	5093	555	8297
Madhya Pradesh	11903	2373	515	9015
Haryana	10635	4918	160	5557
Karnataka	9150	3391	141	5618
Andhra Pradesh*	8929	4516	106	4307
Telangana	7802	3861	210	3731
Bihar	7665	1982	52	5631
Jammu and Kashmir	5956	2492	82	3382
Assam	5586	2170	9	3407
Odisha	5160	1421	19	3720
Punjab	4074	1275	99	2700
Kerala	3172	1492	21	1659
Uttarakhand	2344	802	27	1515
Chhattisgarh	2273	841	11	1421
Jharkhand	2089	672	11	1406
Tripura*	1224	535	1	688
Manipur	841	591	0	250
Ladakh	837	702	1	134
Goa	818	683	0	135
Himachal Pradesh*	674	236	7	431
Chandigarh	406	84	6	316
Puducherry*	367	218	9	140
Nagaland	212	70	0	142
Mizoram	141	132	0	9
Arunachal Pradesh	139	118	0	21
Dadra and Nagar Haveli*	99	72	0	27
Sikkim	78	57	0	21
Andaman and Nicobar Islands	48	11	0	37
Meghalaya	44	6	1	37
Total	**417787**	**166865**	**13708**	**237214**
Cases Being Reassigned to States	9127	9127		
Sum Total	**426914**	**175992**	**13708**	**237214**

COVID-19 Coronavirus Cases in India Updated on 22.06.2020 at 00:07 IST

Clinical features

Initial symptoms consist of fever, cough, nasal congestion, fatigue and other signs of upper respiratory tract infections.[6] In approximately two thirds of the cases, the infection can progress to severe disease with dyspnea and severe lung congestion. Multi-organ failure may eventually result in the form of respiratory failure, shock, acute respiratory distress syndrome, arrhythmia, acute myocardial injury, acute liver injury, and sepsis.[7]

Implications of Dentistry

Dentists are those who deal with the oral cavity. As we are aware that oral cavity is reservoir of plenty of microorganisms, they are high risk of getting infected. The viral load contained in the human saliva as well in blood is very high. Moreover, covid-19 spreads via respiratory droplets, dentists are at the top of the iceberg.[8] Government of India Ministry of Health & Family Welfare Directorate General of Health Services has recommended guidelines in this era of covid- 19 pandemics.[9] A case of covid19 is suspected when he/she had undertaken international flight in the last 14 days or all symptomatic contacts of laboratory confirmed cases or all symptomatic healthcare personnel or all hospitalized patients with severe acute respiratory illness or asymptomatic direct and high risk contacts of a confirmed case.

There is no universal protocol or guideline for dental care provision to active or suspected COVID-19 cases. Hence because of deficiency of standard guidelines and instructions, dental care provision has completely stopped or significantly decreased in several affected countries including India. In addition to increasing the affected populations suffering, this will also incense the burden on hospitals emergency departments already struggle with the pandemic. This lack of guidelines can also increase the nosocomial COVID-19 spread through dental health care facilities. However, Indian dental association (IDA) has recommended[10]-

In clinics

- Posting a sign at the entrance to the dental practice which instructs patients having symptoms of a respiratory infection to please reschedule their dental appointment and call their physician. The same thing applies if they have had any of these symptoms in the last 48 hours.
- Appointments should be reschedule if the patient has traveled outside India in the last two weeks to an area such as China, Hong Kong, Iran, Italy, France, Spain, Germany, Japan, Singapore, South Korea, Taiwan, Thailand, Vietnam or any other COVID19 affected country.
- Provision of only emergency treatment such as unstable maxillofacial fractures that can compromises the patient's airway, diffuse soft tissue bacterial infection with intraoral or extraoral swelling that can compromises the patient's airway and uncontrolled postoperative bleeding.
- Recording of patient temperature readings as part of the routine assessment of patients before performing dental procedures.
- Installation of physical barriers such as glass or plastic windows at reception areas.
- Have patients rinse with a 1% hydrogen peroxide or 1% Betadine solution before each appointment.
- Appropriate use a rubber dam to decrease possible exposure to infectious agents.
- Use high-speed evacuation for dental procedures producing an aerosol.
- Autoclave hand-pieces after each patient. Clean and disinfect public areas frequently, including door handles, chairs and bathrooms.

It is advisable to categorized dental treatment into emergency, urgent, non urgent and elective. Under emergency, cases such as fractures, Ludwig's angina and postoperative bleeding should be considered. Under urgent, cases such as acute pulpitis, pain of fractured vital tooth, avulsed or luxated tooth, dry socket and pericoronitis should be included. Under non- urgent, cases such as asymptomatic fractured or defective restoration, removable partial denture, correction of complete denture, fixed partial denture, scaling, esthetic, orthodontic treatment should come.[11]

Panoramic radiographs should be taken to reduce the excessive salivation and gag reflex with intraoral radiographs. Eggers et al[12] recommended use of 0.23% povidone-iodine mouthwash for at least 15 seconds before the dental procedure. This can be capable of reducing viral load in the saliva. Disposable and single-use instruments and devices should be used whenever possible to reduce the cross-infection risks.[13]

There are certain challenges for the dentists. The use of PPE in each patient is not possible. The hight cost of the PPE kit and the heavy burden of dress make it quite hectic. Dental drills cause the formation of aerosol and splatter commonly contaminated with bacteria, viruses, fungi and blood. Oral surgery drills also cause aerosol in addition to splatter. Periodontal procedures such as ultrasonic scaling have to be avoided. Endodontics cannot use 3 way syringes and airotar as there is high production of aerosols.[14]

Other instructions[15]:-

1) No appointment cards.
2) No cash transactions.
3) Strict Waste disposal protocol.
4) Training & education for assistants.

5) Upon patients arrival, before entering the reception, they should be fumigated, hand sanitized and given mask and gloves to wear.
6) Social/Personal distancing at the reception.
7) Less number of appointments. (Maximum 6 per day).
8) Once the consultation/ procedure is over, then the whole treatment chamber should be fumigated (Patient, dentist, assistants with PPE and the instruments used for the procedure) as it is.
9) After the fumigation, the patient, dentist and assistants with PPE should leave the treatment chamber.
10) Then the treatment chamber, including the instruments used for the procedure should be UV irradiated for 15 minutes.
11) The used instruments should be taken for regular cycle of sterilization.
12) No leather accessories.
13) No metallic ornaments.
14) A/c should be off.
15) Call up all the cases seen/ treated every 7 days for 4 weeks to know about their health condition.
16) One dentist should do once in 3 days consultation/ procedures. This is to prevent viral loading.
17) Doctors who are 50 years and above should avoid seeing the patients. Doctors having, hypertension, diabetes, lung disease and any other systemic diseases should avoid seeing the patients.
18) Treatment area should be a negative pressure chamber.
19) In between patients a minimum of 30 minutes to 60 minutes gap to be given.
20) Shoe cover should be till the knee level. So gumboots are recommended.
21) Face shields and gumboots can be re used how many ever times required by dipping it in 1% NaOCl solution.
22) Single piece PPE should be preferable, so that there won't be any gaps.
23) Before wearing the PPE, regular dress should be removed and wear only PPE in a Separate designated room for wearing them.(Donning Room).
24) After the procedures, PPE should be discarded very carefully in a separate designated room. (Doffing Room)
25) Should take bath and go home.
26) After every patient, the whole chamber, including walls, roofs, knobs..etc., everything should be wiped with 1% NaoCl solution.
27) Separate entry/exit for the patients and a separate entry/exit for the doctors and assistants.
28) N95/ FFP3 masks can be treated in plasma sterilizer (hydrogen peroxide gas) and can be reused for 5 times.
29) House keeping & group D employees should also be provided protective gear.
30) Frequently cleaning of entire hospital is needed & treatment areas need to be fumigated/sanitized after each patient procedure.

Pharmacological management

Patients suspected or confirmed with COVID-19 infections, requiring emergency dental care in case of tooth pain and/or swelling, antibiotics and/or analgesics should be given as an alternative to relief symptoms. It will give dental personnel time to plan & deliver dental treatment with all appropriate & preventive measures to avoid spreading infections.[16] On March 17, 2020, According to the British Medical Journal, use of Ibuprofen is prohibited due to its interference with immune function. Acetaminophen is a drug of choice for analgesia in treating COVID19 infected patients.[17] World Health Organization (WHO) endorsed this recommendation on March 18, 2020.

Many antiviral drugs such as remdesivir, lopinavir-ritonavir, favipiravir, chloroquine (CQ)/hydroxychloroquine (HCQ), convalescent plasma, IL-6 inhibitors are under clinical trials in the treatment of COVID-19.[18] Hydroxychloroquine (HCQ) have been proposed in the management of COVID-19 cases. It mechanisms is through inhibition of receptor recognition process, interference of cell membrane fusion, modification of cell signaling pathway and host defense mechanism and inhibition of T cell activation and cytokine production.[19]

Indian council of Medical Research recommended the use of HCQ by health care workers for prophylaxis against SARS- COV- 2 infection. The dose of HCQ is 400 mg twice a day for day 1, followed by 400 mg once weekly for next 7 weeks to be taken with meals for asymptomatic health care workers. [20]

Conclusion

It is suggested to follow appropriate safety measures to protect dentist from COVID- 19 infection. Adherence to guidelines lay down by Dental council of India, World health organization and Indian dental association is mandatory.

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