

Emergence of B.1.617 Strain of Covid-19 in India and Attitude, Awareness, Perception of Dental Professionals and its Effect on Dentistry: A Survey Report

Abstract:

Objective- To know the attitude, awareness and perception of dental practitioners about double mutant virus in India and how it is affecting their practice.

Material & Method- The cross sectional study was done by doing a survey using google form and a questionnaire was prepared and was sent through social media to dental practitioners all over India. The survey was done for two months from 20th march 2021 to 20th may 2021 before coming for statically analysis for final result.

Result- There were significant difference in between the perception of gender ($p < 0.00$), education ($p < 0.01$) and experience ($p < 0.04$). There were no significant difference in between the perception of different age and job setting about getting infected while doing practice during covid-19. There were significant difference in between the thinking of male and female ($p < 0.03$) and government and private job ($p < 0.00$) about the fact that double mutant strain has increased potential risk for dentists. Generally all the dentists provide PPE kits to dental clinic staff. There were significant differences between age ($p < 0.00$), gender ($p < 0.00$) and experience ($p < 0.00$).

Conclusion- The results of this study conclude that there was significant difference between the attitude, awareness & perception of dental practitioners towards double mutant strain while practicing. The difference may be due to difference in level of education or as there were both BDS and MDS involved in the survey. The other possible reason may be because of experience of practicing years. However most of the dental practitioners agreed at some points.

Keywords: Double Mutant Strain, Dentistry, Pandemic, SARS-Cov-2.

Introduction:

Covid-19 pandemic is continually spreading all over the world and is very infective, causing a crisis on the whole earth. The whole world is in a global pandemic situation due to this virus and seems to be one of the everlasting health problems in the world [1]. Right now Monoclonal antibody (mAb) therapy has gained emergency use approval in few countries; some vaccines also have potential & defensive effects upon COVID-19, which targets the trimeric spike glycoprotein, which is also responsible for the host cell interaction and passage to cell entry as well as the essential target for neutralizing antibodies.

Prashant Ranjan et al. studied and found that seven mutant variants have structural changes in the Receptor binding

domain (RBD) region. They analyzed interactions between RBD variants and ACE2 receptors and the interactions between antibody and RBD variants too. It was found that seven structurally changed variants have high docking score

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against ACE2 receptor compared with wild type and less docking score against antibody (CR3022) unlike wild type [1].

Younger patients, including children, are being affected by this new strain as they are getting infected and some cases requiring ICU admission [2]. Rakesh Sarkar et al. studied SARS-CoV-2 strains harboring both D614G and L37F mutations. In their phylogenetic study, they revealed a new cluster named A2a/3 in the spike protein of new double mutant strain [3].

In many cases, RT-PCR reports show negative status even after the patient is positive with Covid 19 disease [2]. People with high socioeconomic status are reported positive with B.1.167 showing high spreading rate than the previous strain [4]. Many pieces of evidence and studies show that dental practitioners are at very high risk in Covid-19 [5]. Covid-19 virus is continually mutating over time because it contains a spike protein amino acid which grows higher for its pseudo type variations [6].

Both Covid-19 and SARS Cov-2 have a very close resemblance to each other because they have the same amino acid sequence [7]. The dental practice is highly affected due to the nature of this virus [8].

The D614G was the first known mutation that was suspected to start in Eastern China. Many scientists have noted two distinct set of mutations within the virus that causes Covid-19, the H69/V70 deletion, and therefore the D614G, both of which affects the spike proteins, which helps the virus to bind to the human cell, and infect it [9].

Viruses have a tendency that they mutate over time to time including Covid 19 virus, which increases its infectiousness or transmissibility and sometimes limiting propagation. The mutation occurs due to the pathogenesis, virulence, transmissibility, or a combination of these to RNA virus. There are few chances that these vaccines being administered will give full coverage or immunity against the new variant and also there is not sufficient evidence that vaccine which is being used will be able to protect against new mutations in the virus [10].

The transmembrane spike glycoprotein expands from the viral surface & is responsible for viral attachment, fusion and entrance into the host cells, thereby establishing the infection. Although it is not confirmed yet that the changes causing the

expansion of SARS-CoV 2 variants are increasing or decreasing its infection rate & transmission rate, but some researchers have confirmed that the spike protein is the key to differentiate SARS-CoV 2 from other SARS related corona viruses. [11].

Aims & Objective:

The main aim of this study was to know about the attitude, awareness & perception of dental professionals towards B.1.617 Covid 19 double mutant strain in India.

Material and Methods:

Study Design:

This study was a multiple-choice objective type questionnaire and it was conducted among dental professionals in India which were working in private clinics, hospitals, health centers as well as dental colleges. The online questionnaire was prepared according to WHO and CDC guidelines. For easier collection of data all the questionnaire was designed according to electronic data base survey. This was a cross sectional survey study among dental professionals in 5 states. The Questionnaire was then sent to all the authors to collect the data from their perspective state, who forwarded it ahead to the dental professionals in their state. A total number of 1443 dental practitioners participated in this study.

Inclusion criteria

Dental Practitioners (BDS, MDS), Post Graduate Students (BDS, Pursuing MDS)

Exclusion Criteria

Non Registered Dental Practitioners without BDS degree, Under Graduate Students (Pursuing BDS), Those who were not willing to participate in this survey.

Setting the sample size

This study was consisted of dental practitioners who were completed their BDS/MDS degree or who have completed their BDS degree and pursuing MDS degree in India. Sample size was finalized after the answers were given by practitioners up to given date.

Survey Schedule

The survey was systematically schedule for two months from 20th march to 20th may. During this time period the questionnaire was shared with all the authors and was sent to them by using social media. Then all these questions were

sent to their perspective states to collect the data. In this survey only those participants were considered who have given all the answers. The data obtained was anonymous and tracing the identity of dental practitioners was not possible.

Statistical Analysis:

The questionnaire were encrypted and then entered into Microsoft excel 2007. After that all the absolute and relative frequencies were measured of central tendency and dispersion were calculated as appropriate. Also chi square test was used to find the significant association between the parameters and P value <0.05 was considered as significant. The calculation was performed using SSPS software version 22.0

Results:

A cross sectional study was conducted among dentists in India. A total 1443 dentists responded to the pre-formed goggle doc questionnaire.

Table No. 1

Age	COVID-19 has changed your perception of infection			double mutant strain of COVID-19 has increased potential risk	
	May be	No	Yes	Dental professional	Equally for both
20-30	12	6	384	48	354
30-40	17	12	826	96	759
More than 40	0	0	195	28	167
	P=0.062 chi square=18.2			P=0.47 chi square=1.49	
Gender					
Male	18	0	525	77	466
Female	11	18	880	95	814
	P= 0.00 chi square=18.2			P= 0.03 chi square=4.5	
Education					
BDS	23	12	747	90	692
MDS	6	6	658	82	588
	P=0.01 chi square=9.01			P=0.36 chi square=0.18	
Experience					
5-10 YEARS	11	12	485	54	454
LESS THAN 5	12	6	588	78	528
MORE THAN 5	6	0	332	40	298
	P=0.04 chi square=9.9			P=0.51 chi square=1.33	
Job setting					
Government	0	0	102	0	102
Private	29	18	1303	172	1178
	P=0.16 chi square=3.67			P=0.00 chi square=14.74	

Covid 19 has changed perception of dentist perception of infection- There were significant difference in between the perception of gender (p<0.00), education (p<0.01) and experience (p<0.04). There were no significant difference in between the perception of different age and job setting.

Double stain of Covid 19 has increased potential risk for dentist- There were significant difference in between the thinking of male and female (p<0.03) and government and private job (p<0.00).

Table No. 2

Age	impact of second wave of COVID-19 disease on your practice			COVID-19 test before visiting to your clinic		
	No	No	No	No	No	Yes
20-30	6	12	12	12	12	366
30-40	18	24	24	24	12	802
More than 40	0	10	10	10	6	183
	P= 0.002 chi square=16.7			P= chi square=		
Male	6	118	419	29	149	365
Female	18	131	760	17	232	660
	P=0.01 chi square=13.1			P= 0.01 chi square=14.7		
BDS	12	131	639	29	198	555
MDS	12	118	540	17	183	470
	P= 0.8 chi square=0.355			P= 0.34 chi square=2.14		
Experience						
5-10 YEARS	12	70	426	6	148	354
LESS THAN 5	12	132	462	12	174	420
MORE THAN 5	0	47	291	28	59	251
	P= 0.00 chi square=23.82			P=0.00 chi square=50.7		
Job setting						
Government	0	12	90	0	6	96
Private	24	237	1089	46	375	929
	P=0.14 chi square=4.33			P= 0.00 chi square=29.4		

Perception of dentist regarding patient should undergone Covid 19 test before visiting clinic- Mostly dentists think that patient having symptoms like covid19 should test before visiting dental clinic. There were significant difference the perception of gender (p<0.01), experience (p<0.00) and job setting (p<0.00).

Impact of second wave Covid 19 on dental practice- Mostly dentists said that the second wave of covid 19 has impacted dental practice and they are anxious about it. There were significant differences between age (p<0.002), gender (p<0.03) and experience (p<0.00).

Table No. 3

age	classical symptoms of the patient having the double mutant strain of COVID-19					your occupation at more risk for yourself		
	Fever	Headache and fatigue	Shortness of breath	Sore throat	All of the above	May be	No	Yes
20-30	12	48	42	300	24	12	366	
30-40	70	24	90	48	623	41	12	802
More than 40	24	6	12	6	147	6	6	183
	P value=0.00 chi square=89.3					P=0.13 chi square=6.94		
Gender								
Male	22	18	72	12	419	24	0	519
Female	84	60	72	42	651	47	30	832
	P value=0.00 chi square=35.87					P=0.00 chi square=18.9		
Education								
BDS	41	24	66	24	627	36	18	728
MDS	65	54	78	30	443	35	12	623
	P value=0.00 chi square=122.04					P=0.69 chi square=0.74		
Experience								
5-10 YEARS	47	18	60	24	359	23	12	473
LESS THAN 5	12	54	84	18	438	42	12	552
MORE THAN 5	47	6	0	12	273	6	6	326
	P value=0.00 chi square=41.89					P= 0.01 chi square=13.05		
Job setting								
Government	18	12	12	0	60	0	0	102
Private	88	66	132	54	1010	71	30	1249
	P value=0.00 chi square=32.18					P= 0.01 chi square=8.2		

Dentist occupation at more risk to yourself and immediate

environment infected and transmission of disease- Mostly dentists had the perception that their occupation was at more risk to themselves. There were significant differences between the gender (p<0.03) and job setting (p<0.00).

Most common classical symptoms of the patient of double mutant Covid 19- Mostly dentists had perception that Covid 19 patients had all symptoms i.e. fever, cough, cold, headache, sore throat and shortness of breath. There were significant difference between the entire study variable i.e. age, gender, education, experience and job setting.

Table No 4

age	Extra-oral suction while doing high aerosol production			safety measures while performing a dental procedure				
	No	Sometimes	Yes	PPE kit N-95 mask	PPE kit, hepa filters	All safety measures	None	
20-30	144	60	198	144	0	258	0	
30-40	344	41	470	274	6	563	12	
More than 40	60	6	129	48	0	147	0	
	P= 0.00 chi square=54.85			P value-0.002 chi square=20.38				
Gender								
Male	178	42	323	12	419	190	0	347
Female	370	65	474	42	651	276	6	621
	P= 0.010 chi square=9.14			P value-0.05 chi square=7.66				
Education								
BDS	326	60	396	24	627	256	6	514
MDS	222	47	401	30	443	210	0	454
	P= 0.02 chi square=12.78			P value-0.13 chi square=5.65				
Experience								
5-10 YEARS	203	12	293	24	359	186	6	316
LESS THAN 5	216	66	324	18	438	198	0	402
MORE THAN 5	129	29	180	12	273	82	0	250
	P=0.00 chi square=30.64			P value-0.00 chi square=32.21				
Job setting								
Government	54	6	42	0	60	18	0	84
Private	494	101	755	54	1010	448	6	884
	P= 0.005 chi square=10.8			P value-0.006 chi square=12.54				

Safety measures use at while performing a dental procedure- Maximum dentists had used all the safety measures which were recommended by WHO. There were significant differences between age (p<0.002), gender (p<0.05) experience (p<0.00) and Job setting (p<0.006).

Use extra suction while doing dental procedure with high aerosol- Mostly dentists had used extra suction while doing dental procedure with high aerosol generating procedures (endodontic treatment or scaling). There were significant differences between all the study variables i.e. age, gender, education, experience and job setting.

Table No. 5

Age	history of patient when they enter the clinic			staff also wear appropriate PPE kit		
	No	Some-time	yes	No	Some-time	yes
20-30	0	36	366	120	36	246
30-40	29	77	749	221	142	492
More than 40	0	11	184	71	11	113
	P=0.00 chi square=23.4			P=0.00 chi square=29.02		
Gender						
Male	6	29	508	167	29	347
Female	23	95	791	245	160	504
	P=0.00 chi square=15.47			P=0.00 chi square=45.14		
Education						
BDS	29	82	671	221	95	466
MDS	0	42	628	191	94	385
	P= 0.00 chi square=34.89			P=0.53 chi square=1.26		
Experience						
5-10 YEARS	11	42	455	132	101	275
LESS THAN 5	12	54	540	198	48	360
MORE THAN 5	6	28	304	82	40	216
	P=0.98 chi square=0.34			P=0.00 chi square=41.25		
Job setting						
Government	0	0	102	36	12	54
Private	29	124	1197	376	177	797
	P=0.002 chi square=12.9			P=0.27 chi square=2.5		

Travel history of patient and check temperature, pulse and oxygen concentration while enter in clinic- Maximum dentists had taken travel history of patient and checked temperature, pulse and oxygen concentration before they entered the clinic. There were significant differences between age (p<0.00), gender (p<0.00) experience (p<0.00) and Job setting (p<0.002).

Dental clinic staff wear personal protective equipment in the clinic- Generally all the dentists provided PPE kits to dental clinic staff. There were significant differences between age (p<0.00), gender (p<0.00) and experience (p<0.00).

Discussion:

This questionnaire study provides the attitude, perception and awareness of dental practitioners practicing in India towards the double mutant strain of Covid-19. In this study we found the variation in responses of practitioners about symptoms of covid-19, testing of patients before treatment, safety measures for covid-19 and practicing perception. Most of the practitioners were using personal protecting gear as safety measures and most of the practitioners were in favor of patients undergoing Covid negative report before treatment.

The Double Mutant Strain or simply B.1.617 was first seen in India in April 2021 according to Indian Express and many news sources as this virus is combination of two or more strains. B.1.617 was first seen in United Kingdom and has eight mutations in its spike protein. B.1.351 strain was first

seen in South Africa and is due to E484K mutation. Variant of B.1.1.28 lineage was seen in Brazil and has ten mutations in its spike gene and all these variants affected many people in 2nd wave of covid-19 because of its high transmissibility [1] and also surpassing RT-PCR test thus difficult to determine the correct diagnosis.[2] [10].

Several studies suggest that this mutation has high mortality rate than previous strain. This high mortality rate is because of replication of SARS-CoV2 in epithelial cells of lungs resulting in fall of SpO2 level of patients within 2 days after getting infected thus making efficiency of vaccine questionable [12].

The new double mutant strain is also harmful for children because during these months it was noticed that children were also getting infected which were safe during previous strain, though evidence of mortality is very low seen in children and there is a rare chance of severity of infection [13].

Dental practitioners are at high risk because of working in close contact of patient along with several aerosol generating procedures and if a patient coughs or sneezes in between the procedure and if he's asymptomatic, there is chance of getting infected as it spreads through droplets [14] [15].

Conclusion:

We have entered in the second year of covid-19 and after few relaxing months this virus is emerging at a very high speed with more infectious and mortality rate. As we all know that covid-19 is a RNA virus which have the tendency to mutate over time, therefore it is very important that we should do its monitoring very closely. Many countries have developed several vaccines like India has Covishield and Covaxin, Moderna & Pfizer in USA, Sinovac in China, Sputnik V in Russia and antibody cocktail which has given emergency usage permission in many countries. If vaccines are administrated to 70% population to in their respective countries, it will play an important role in creating herd immunity against covid-19.

References:

- 1) Ranjan P, Neha, Devi C, Das P. Bioinformatics analysis of SARS-CoV-2 RBD mutant variants and insights into antibody and ACE2 receptor binding. bioRxiv. <https://doi.org/10.1101/2021.04.03.438113>.
- 2) CME INDIA COVID-19 Management Protocol – April 2021.
- 3) Sarkar R, Banerjee A, Dutta S, Sarkar MC. Emergence of SARS-CoV-2 stains harbouring the signature mutations of both A2a and A3 clade. med Rxiv preprint. <https://doi.org/10.1101/2021.02.04.21251117>.
- 4) Gupta S, Agrawal R, Grover SD, Soorganj N, Reddy SS, Aila SK. Awareness, Perception, and Attitude of Dental Practitioners Toward COVID-19 and Their Role in Its Prevention in Central Madhya Pradesh: A Questionnaire Study. *International Journal of Oral Care and Research*. 2021;9(1):26-29.
- 5) Sharma A, Balpande R, Shrivastava A, Deshmukh G, Bargaje P, Sharma S. Covid-19 and its effect on dentistry. *Journal of Advances in Medicine and Medical Research*. 2020; 32(21):14-24.
- 6) Korber B, Fischer WM, Gnanakaran S, Yoon H, Theiler J, Abfalterer W, Hengartner N, Giorgi EE, Bhattacharya T, Foley B, Hastie KM, Parker MD, Partridge DG, Evans CM, Freeman TM, Desilva TI, Mcdanal C, Perez LG, Tang H, Moonwalker A, Whealan SP, Lebranche CC, Saphire EO, Monteflori DC. Tracking changes in SARS-CoV-2 spike: evidence that D614G increases infectivity of the COVID-19 virus. August 20, 2020 Published by Elsevier Inc. <https://doi.org/10.1016/j.cell.2020.06.043ll>.
- 7) Chen WH, Hotez PJ, Bottazzi ME. Potential for developing a SARS-CoV receptor-binding domain (RBD) recombinant protein as a heterologous human vaccine against coronavirus infectious disease (COVID)-19, *Human Vaccines & Immunotherapeutics*. 2020;16(6):1239-1242.
- 8) Ali S, Farooq I, Abdelsalam M, Alhumaid J. Current clinical dental practice guidelines and the financial impact of COVID-19 on dental care providers. *Eur J Dent*. 2020;14(suppl S1):S140-S145.
- 9) Swarna A. Mini Review - New emerging COVID Strain. *J Intensive & Crit Care*. 2020;6(25):1-2.
- 10) Banerjee R, Rajachandran V, Ganguly D, Chattopadhyay S. Spike protein mutational landscape in India: Could Muller's ratchet be a future game-changer for COVID-19? <https://doi.org/10.1101/2020.08.18.255570> doi: bioRxiv preprint.
- 11) Wang, P., Nair, M.S., Liu L, Iketani S, Luo Y, Guo Y, Wang M, Yu J, Zhang B, Kwong PD, Graham BS, Mascola JR, Chang JY, Yin MT, Sobieszczyk M, Kyratsous CA, Shapiro L, Sheng Z, Huang Y, Ho DD. Antibody resistance of SARS-CoV-2 variants B.1.351

- and B.1.1.7. *Nature* 593, 130–135 (2021).
<https://doi.org/10.1038/s41586-021-03398-2>.
- 12) Novel corona virus disease (COVID-19) Situation report 68.
- 13) Rubens JH, Akindele NP, Tschudy MM, Samuels ACS. Acute covid-19 and multisystem inflammatory syndrome in children. 2021. *BMJ*;372:n385
<http://dx.doi.org/10.1136/bmj.n385>.
- 14) Nihra V. Evolving Patterns in COVID-19: The Virus, its Variants and Infectivity-cum-Virulence. *Biomed J Sci& Tech Res*.2021:1-11.
- 15) Srivastava S, Banu S, Singh P, Sowpati DT, Mishra RK. SARS-CoV-2 genomics: An Indian perspective on sequencing viral variants. *J Biosci*. 2021;46(1):22. doi: 10.1007/s12038-021-00145-7. PMID: 33737495; PMCID: PMC7895735.