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SARS COV 2 VIRUS: FROM PANDEMIC TO MALIGNANCY?

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Abstract:

Context:

Covid 19 patients present a myriad of clinical signs and symptoms with variable severity. There are many symptoms in the oral cavity; among them, the most prevalent ones are dysgeusia (taste disorders), oral pain, the exacerbation of autoimmune diseases as well as the herpes simplex virus (HSV) and varicella zoster virus (VZV) infections. Mucormycosis ,ulcerations and aphthous stomatitis are also often mentioned.

Aims:

This study aims to report few cases with oral manifestations and try to detect a pattern in them.

Settings and Design:

A series of cases of COVID-19 infection, with oral necrotic ulcers and aphthous-like ulcerations which developed early or during the course of disease after the development of dysgeusia and affected the tongue, lips, palate, and oropharynx.

Methods and Material:

The study population comprised of patients admitted in Covid dedicated hospital in Bhopal in the age group of 20-80 years. Approval from institutional ethical committee was taken.

The sample size is 53. Informed consent was obtained from participants of the study before examination.

Results:

The CBC findings of this investigation showed high levels of CRP. This rise of CRP can be explained by the response of the human body to the new COVID-19 infection.

Conclusions:

The present study has shown the CBCs of patients with oral lesions the most likely laboratory findings in these patients were abnormalities in RBCs, WBC, CRP and D DIMER. Clinicians should consider these parameters when reading the CBC of COVID-19 patients for early diagnosis and better treatment planning

Key-words: COVID-19, CDC GUIDELINES, DENTISTRY, CRP, D DIMER, MCH, MCV, WBC, RBC

INTRODUCTION

COVID 19: a sovereign ailment to all maladies. Globally as of 17th September 2021, 21.9 crore cases are reported with more than 4 lakh deaths as reported by WHO. India has reported more than 33 million Covid cases, second only to the US. The country is also only the third in the world to record more than 440,000 deaths - behind the US and Brazil creating an unprecedented global war where humans are facing the same villain, the novel corona virus.

India gave six million jabs on an average every day in August, compared to 4.3 million daily jabs in July, according to official data. But September has seen a rise with more than 7.4 million doses administered daily.

But **there is anticipation by the researchers saying that a third wave is likely** given that the country has fully reopened even as the threat of new variants looms large.

Covid 19 patients present a myriad of clinical signs and symptoms with variable severity. There are many symptoms in the oral cavity; among them, the most prevalent ones are dysgeusia (taste disorders), oral pain, the exacerbation of autoimmune diseases as well as the herpes simplex virus (HSV) and varicella zoster virus (VZV) infections. Mucormycosis ,ulcerations and aphthous stomatitis are also often mentioned.

As a researcher we would be dealing with 2 aspects: first being vigilant and second is about knowledge of the oral manifestation which is essential for early diagnosis of disease. The current findings we are noticing in the oral cavity are ulcer, erosion, bulla, vesicle, pustule, fissured or depapillated tongue, macule, papule, plaque, pigmentation, halitosis, whitish areas, hemorrhagic crust, necrosis, petechiae, swelling, erythema, and spontaneous bleeding.[1] It is symptomatic in 68% of cases and common sites of involvement are the tongue (38%), labial mucosa (26%), and palate (22%).[2]

In recent months, survivors of COVID-19 who have had the disease for weeks to months—termed "long haulers"—describe oral problems they're experiencing such as "teeth falling out, sensitive gums, teeth turning grey, and teeth cracking."[3] The mouth might be the most vulnerable area to this virus due to the abundance of the ACE2 (angiotensin converting enzyme) receptor in oral tissue. A new preprint study found that, compared with other oral tissues, cells of the salivary glands, tongue, and tonsils carry the most RNA linked to proteins that the SARS-CoV-2 virus needs to infect cells. Namely, these include the ACE2 receptor and an enzyme called TMPRSS (transmembrane protease, serine 2), which allows the virus to fuse its membrane with that of the host cell and slip inside.

AIMS AND OBJECTIVE:

This study aims to assess and evaluate the pattern of oral lesions found in Covid patients.

The objective was to assess the oral lesions occuring in Covid 19 patients and to evaluate the clinical and laboratory characteristics in these patients.

SUBJECTS AND METHODS:

i. **Survey design:**

The study population comprised of patients admitted in Covid dedicated hospital in Bhopal from the age group of 20-80 years. The approval from institutional ethical committee was taken. The sample size for this study was 53 patients. Informed consent was obtained from participants of the study before examination. The timeline for this study was 15 days from 1st of May 2021 to 15th May 2021.

ii. **Sampling method:**

The COVID patients were clinically evaluated for oral lesions and their haematological reports were considered for detecting the pattern. With limited resources, the patients were asked about the symptoms, lesion was examined. Based on the morbidities, age cases were divided into clusters.

iii. **Inclusion criteria**:

- Age: 20- 80 years
- Patients who are Covid positive (RT- PCR)
- Patient with underlying diseases.

iv. **Exclusion criteria**:

- Patients with autoimmune diseases
- Immunocompromised patients
- In oxygen therapy
- Pediatric patients

v. **Statistical analysis**:

Data was analyzed through python programming. Descriptive statistical analysis was used to analyse the variables included in the study. Mean scores and standard deviations were calculated and were used to analyse the continuous variables. Percentages were used to describe the categorical data. Analysis of Variance test (ANOVA) was used to find significance between two groups. The significance level was set at 0.05.

Oral examination:


Results:

i. Socio-demographic characteristics

The total numbers of cases were 53. The present study showed nearby equal number of male and female patients.The mean value of age group was 45. The number of co morbid patients included 30% diabetic, 26% hypertensive and 15% both. Oral lesions were detected in 18.3% of patients.

ii. **Analysis of all the patient:**

1. Distribution of age for the patient suffering from oral lesions:

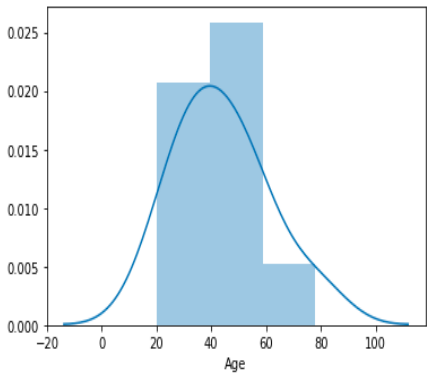


Figure depicts the randomness of age who are suffering from oral lesions as it does not depend upon the age. It neither depends upon the gender.

2. Patient who are diabetic or who is suffering from blood pressure does not have the problem of Oral lesions.

Conclusion:

The variables Age, gender, diabetic and blood pressure does not have any impact on Oral lesions

iii. Analysis of all the patient suffering from Oral lesions:

Based on ‘D dimer’, ‘C rp’, ‘WBC’, ‘RBC’, ‘MCV’ and ‘MCH’ patients has been clustered together.

1. The first cluster represents:

Patient no.	Age	Gender	Diabetic	BP	Oral lesions	D dimer	C rp	WBC	RBC	MCV	MCH
P_3	58	f	NO	NO	YES	0.52	2.40	5.50	3.43	89.0	28.3
P_15	43	m	NO	NO	YES	0.90	1.30	9.80	4.67	68.0	20.4
P_19	56	f	NO	NO	YES	4.80	4.50	5.90	4.47	89.7	28.4
P_21	29	m	NO	NO	YES	4.90	6.23	13.40	4.77	95.5	31.2
P_23	36	m	NO	NO	YES	11.60	5.92	3.79	3.94	91.7	33.3

a. The content of D dimmer for every patient is greater than 0.5.

b. The content of others value are approximately normal.

c. For the patient P_23 content of D dimmer is very high , his WBC is low and MCH is slightly higher than normal.

d. For the patient P_21 content of C rp and WBC is slightly higher than normal.

2. The second cluster represents:

Patient no.	Age	Gender	Diabetic	BP	Oral lesions	D dimer	C rp	WBC	RBC	MCV	MCH
P_13	40	f	NO	NO	YES	0.92	1.1	71.2	4.51	69.0	20.1

The person P_13 has very has WBC content and low MCV and MCH content.

3. The third cluster represents:

Patient no.	Age	Gender	Diabetic	BP	Oral lesions	D dimer	C rp	WBC	RBC	MCV	MCH
P_14	49	f	YES	NO	YES	1.3	2.8	10.6	2.2	25.5	31.7

For the patient P_14, except the C rp values all the content are abnormal.

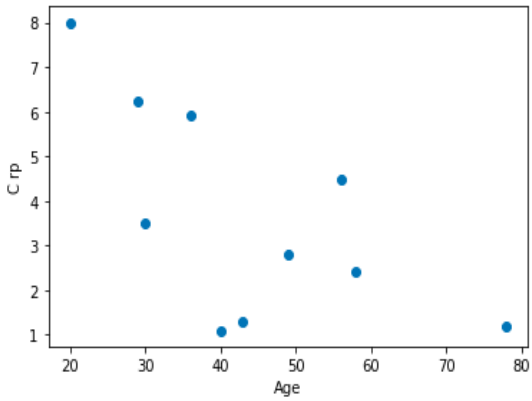
4. The fourth cluster represents:

Patient no.	Age	Gender	Diabetic	BP	Oral lesions	D dimer	C rp	WBC	RBC	MCV	MCH
P_2	20	m	NO	NO	YES	0.23	8.0	23.4	4.02	114.0	36.7
P_5	78	m	YES	YES	YES	2.61	1.2	25.6	4.83	93.0	29.5
P_16	30	m	NO	NO	YES	1.40	3.5	25.6	4.83	93.0	29.5

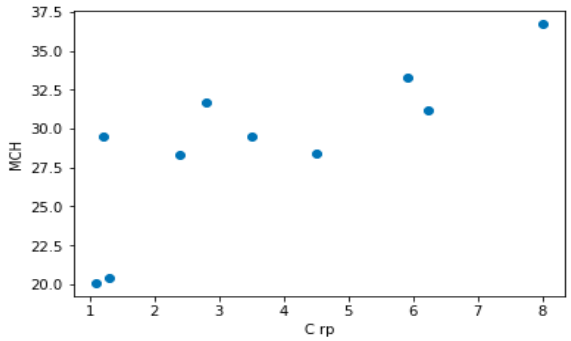
a. The WBC content for all the patient in this cluster is high.

b. For the patient P_2 the content of MCH, C rp and MCV is abnormal.

From the plot below:

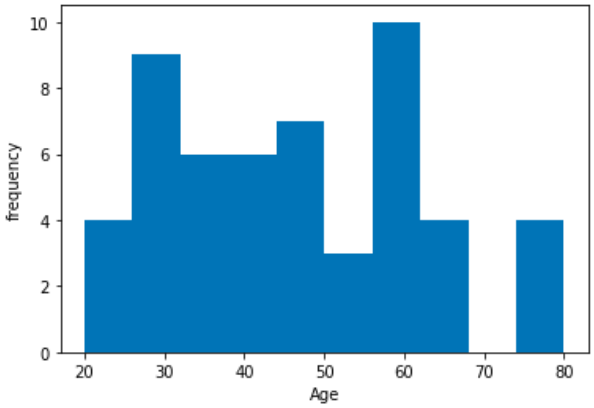


C rp and Age of patients are inversely related.



MCH and C rp content of patient are positively related.

The figure below represents histogram of Age of different patient:



1. Patient are from 20 to 80 years of age.
2. Median value is 45 an mean is equal to 45.86

There are 57 percentage male and 43 percentage female patients.
30 percentage of the patient are diabetic.
26 percentage of the patient are suffering from hypertension.
15 percentage of the patient have both diabetes and hypertension.

Summary statistics of variable:

	D dimer	C rp	WBC	RBC	MCV	MCH
count	10	10	10	10	10	10
mean	2.918	3.695	19.479	4.167	82.84	28.91
std	3.478578	2.398357	20.00219	0.829365	24.03891	5.210556
min	0.23	1.1	3.79	2.2	25.5	20.1
Q1	0.905	1.575	6.875	3.96	74	28.325
Median	1.35	3.15	12	4.49	90.7	29.5
Q3	4.2525	5.565	25.05	4.745	93	31.575
max	11.6	8	71.2	4.83	114	36.7

Discussion:

The median age of our study was **45** years. Several studies have reported an older median age of 50.0–57 years in patients with severe conditions. 30 percentages of the patients are diabetic. 26 percentage of the patient are suffering from hypertension.

15 percentage of the patient have both diabetes and hypertension. The variables Age, gender, diabetes and hypertension do not have any impact on Oral lesions. The CBC findings of this investigation showed high levels of CRP.This rise of CRP can be explained by the response of the human body to the new COVID-19 infection. Zhang et al. reported that increased leukocytes (P=0.003) were commonly observed in severe cases[4]. In favour to our observations, leukocytosis was observed in the groups presenting with comorbidities.

Aphthous-like lesions, herpetiform lesions, candidiasis, Mucormycosis and oral lesions of Kawasaki-like disease are the most common oral manifestations of COVID-19 disease. Lack of oral hygiene, opportunistic infections, stress, underling diseases (diabetes mellitus, immunosuppression), trauma (secondary to intubation), vascular compromise, and hyper-inflammatory response secondary to COVID-

19 might be are the most important predisposing factors for the development of oral lesions in COVID-19 patients.[5,6]

This study demonstrates the importance of the close link between SARS-CoV-2 and oral manifestations. There is no scientific evidence in the literature that certifies which oral symptoms SARS-CoV-2 can actually cause. In fact, from the analysis of our data, it is hard to notice that clinical conditions that patients manifest are due to the SARS-CoV-2

The present study has shown the CBCs of patients with oral lesions the most likely laboratory findings in these patients were abnormalities in RBCs, WBC, CRP and D DIMER. Clinicians should consider these parameters when reading the CBC of COVID-19 patients for early diagnosis and better treatment planning.

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