

## Original Research

### Pancreatic manifestation of COVID-19 patients

Dr. Afsal B<sup>1</sup>, Dr. Thangaraj Sharmiladevi<sup>2</sup>, Dr. Abhishek Dubey<sup>3</sup>, Dr. Shivam Shukla<sup>4</sup>, Dr. Anwesha Biswas<sup>5</sup>, Dr. Vaibhav Pandita<sup>6</sup>

<sup>1</sup>Assistant Professor, Dept of Oral & Maxillofacial Surgery, Kannur Dental College, Anjarakandy, Kannur, Kerala;

<sup>2</sup>Postgraduate, Department of General Surgery, Sri Siddhartha Medical College and Hospital, Sri Siddhartha Academy of Higher Education Tumkur, Karnataka;

<sup>3</sup>Senior Lecturer, Seema Dental College and Hospital, Rishikesh, Uttarakhand;

<sup>4</sup>BDS (Chandra Dental College & Hospital, Lucknow) Private Practitioner, Lucknow;

<sup>5</sup>M.D.S, 3rd year department of Oral Medicine and Radiology A.B Shetty Memorial Institute of Dental Sciences, Mangalore;

<sup>6</sup>M.D.S, 2nd year department of Oral Medicine and Radiology A.B Shetty Memorial Institute of Dental Sciences, Mangalore

#### ABSTRACT:

**Background:** Coronavirus disease-2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). The present study was conducted to assess pancreatic manifestation in COVID-19. **Materials & Methods:** The present study comprised of 48 patients with COVID-19 infection of both genders. All patients were subjected to blood cytology, biochemistry, and inflammatory indicators. Pancreatic injury was defined as any abnormality in amylase and lipase level. **Results:** Common symptoms were fever in 90%, breathlessness in 75%, cough in 68%, fatigue in 76%, headache in 42% and diarrhoea in 38%. The difference was significant ( $P < 0.05$ ). Leukocytes (X109/L) count was 5.26, neutrophils (X109/L) were 3.78, platelets (X109/L) were 195.2, monocytes (X109/L) were 0.45 and lymphocytes (X109/L) were 0.92. The mean amylase (U/L) level was 53.6, lipase (U/L) was 31.7, creatinine kinase (U/L) was 120.4, CRP (mg/L) was 36.1 and ESR (mm/ hr) was 25.9. **Conclusion:** COVID-19 infection has maximum chances of pancreatic involvement even in mild cases, hence careful assessment of biochemistry is required.

**Key words:** Amylase, COVID-19, Pancreas

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**Corresponding author:** Dr. Afsal B, Assistant Professor, Dept of Oral & Maxillofacial Surgery, Kannur Dental College, Anjarakandy, Kannur, Kerala, India

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#### INTRODUCTION

Coronavirus disease-2019 (COVID-19) which is caused by severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has spread throughout the world causing problems for millions of people. COVID-19 is present mostly with upper respiratory symptoms. The most common symptoms are fever, cough, and fatigue; however, gastrointestinal symptoms such as diarrhea, vomiting, and abdominal pain were also reported.<sup>1</sup>

The coronavirus disease 2019 (COVID-19) pandemic has now affected >54 million people and caused >1.3 million deaths worldwide in 2020. Acute pancreatitis is commonly seen among patients suffer from COVID-19.<sup>2</sup> The more common causes of acute pancreatitis are gallstones and alcohol abuse, however viral-induced acute pancreatitis has also been described. Angiotensin-converting enzyme-2 (ACE2), the functional virus host cell receptor, expressed in both exocrine and endocrine pancreatic cells, plays a role in this disease process. The mechanisms of

pancreatic injury in SARS-CoV-2 infection include direct cytopathic effects or indirect systemic inflammatory and immune-mediated cellular responses, resulting in organ damage or secondary enzyme abnormalities.<sup>3</sup>

Strong associations are more likely to be causal than weak associations. Acute pancreatitis seems to be a very infrequent complication of COVID-19. If COVID-19 is associated with acute pancreatitis, an increase in otherwise idiopathic acute pancreatitis incidence is expected in patients with COVID-19. According to a retrospective cohort study analysing 11,883 hospitalized patients with COVID-19 from 12 hospitals in the USA, there were 32 cases of acute pancreatitis, yielding a point prevalence of 0.27%, 69% of them idiopathic.<sup>4</sup>

Recent studies have focused mainly on the epidemiologic and clinical characteristics of patients with confirmed infection.<sup>5</sup> Little attention has been paid to the pancreatic injury caused by SARS-CoV-2 infection. The present study was conducted to assess pancreatic manifestation in COVID-19.

## MATERIALS & METHODS

The present study comprised of 48 patients with COVID-19 infection of both genders. All enrolled patients verbally informed and their written consent was obtained. The disease was confirmed by detecting SARS-CoV-2 nucleic acid in throat swab samples by using the reverse-transcription polymerase chain reaction assay (rt-PCR) method.

Data related to patients such as name, age, gender etc. was recorded. All patients were subjected to blood cytology, biochemistry, and inflammatory indicators. Pancreatic injury was defined as any abnormality in amylase (normal range, 0–90 U/L) or lipase (normal range, 0–70 U/L). Serious illness was defined if at least 1 of the following items was present: (1) breathing rate, >30/min, pulse oximeter oxygen saturation, <93% at rest; or ration of partial pressure of arterial oxygen to fraction of inspired oxygen, <300 mm Hg. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered statistically significant.

## RESULTS

**Table I Distribution of patients**

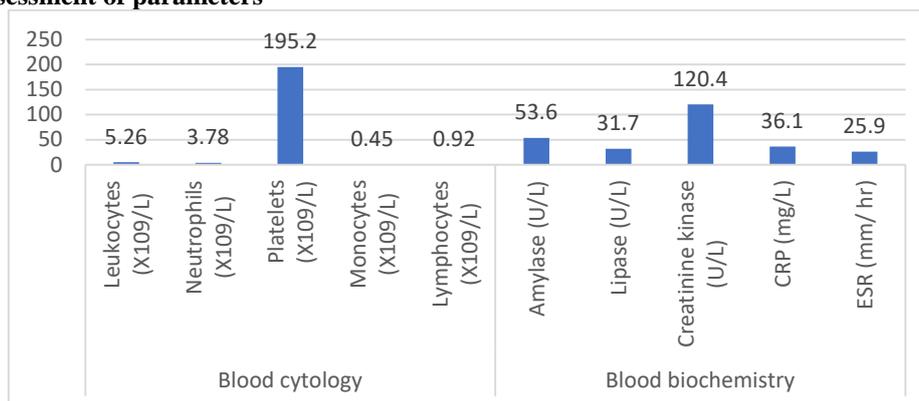
Total- 48		
Gender	Males	Females
Number	28	20

Table I shows that out of 48 patients, males were 28 and females were 20.

**Table II Assessment of parameters**

Variables	Parameters	Mean	P value
<b>Symptoms</b>	Fever	90%	0.05
	Breathlessness	75%	
	Cough	68%	
	Fatigue	76%	
	Headache	42%	
	Diarrhoea	38%	
<b>Blood cytology</b>	Leukocytes (X10 <sup>9</sup> /L)	5.26	-
	Neutrophils (X10 <sup>9</sup> /L)	3.78	-
	Platelets (X10 <sup>9</sup> /L)	195.2	-
	Monocytes (X10 <sup>9</sup> /L)	0.45	-
	Lymphocytes (X10 <sup>9</sup> /L)	0.92	-
<b>Blood biochemistry</b>	Amylase (U/L)	53.6	-
	Lipase (U/L)	31.7	-
	Creatinine kinase (U/L)	120.4	-
	CRP (mg/L)	36.1	-
	ESR (mm/ hr)	25.9	-

Table II, graph I shows that common symptoms were fever in 90%, breathlessness in 75%, cough in 68%, fatigue in 76%, headache in 42% and diarrhoea in 38%. The difference was significant (P< 0.05). Leukocytes (X10<sup>9</sup>/L) count was 5.26, neutrophils (X10<sup>9</sup>/L) were 3.78, platelets (X10<sup>9</sup>/L) were 195.2, monocytes (X10<sup>9</sup>/L) were 0.45 and lymphocytes (X10<sup>9</sup>/L) were 0.92. The mean amylase (U/L) level was 53.6, lipase (U/L) was 31.7, creatinine kinase (U/L) was 120.4, CRP (mg/L) was 36.1 and ESR (mm/ hr) was 25.9.

**Graph I Assessment of parameters**

## DISCUSSION

Acute pancreatitis is not specifically caused by SARS-CoV-2; it is a common disease with many causes, and the aetiology remains unknown in 15–25% of cases.<sup>6</sup> Studies have detected a higher proportion of idiopathic acute pancreatitis among patients with COVID-19. AP in patients is most commonly caused by drugs, trauma, and gallstones.<sup>7,8</sup> Less common causes of AP have been reported as infections. The relation between AP and some viruses such as CMV, HIV, HSV, EBV, VZV, mumps virus, coxsackievirus, and some others has been proven.<sup>9</sup> Based on the Revised Atlanta Classification System for AP Diagnosis, at least two of the three following criteria should be found- abdominal pain (defined as acute onset, persistent, severe epigastric pain often radiating to the patients' back), increased serum lipase or amylase levels to greater than 3 times the upper limit of normal value, and characteristic findings of AP on contrast-enhanced CT. AP was diagnosed in our patient based on the Atlanta criteria. In the search for etiology, none of the common causes of AP was found and the only significant finding was a positive SARS-CoV-2 PCR test. Recent studies have shown gastrointestinal symptoms are fairly common in COVID-19 but the relation between COVID-19 and AP has not been described.<sup>10</sup> The present study was conducted to assess pancreatic manifestation in COVID-19.

In present study, out of 48 patients, males were 28 and females were 20. We found that common symptoms were fever in 90%, breathlessness in 75%, cough in 68%, fatigue in 76%, headache in 42% and diarrhoea in 38%. The preliminary results of an international multi-centre retrospective and prospective case-control study compared 149 patients with acute pancreatitis and COVID-19 and 1,628 patients with COVID-19-negative acute pancreatitis, showed a rate of idiopathic acute pancreatitis of 24% versus 14% respectively ( $P = 0.001$ ).<sup>11</sup>

We found that Leukocytes (X109/L) count was 5.26, neutrophils (X109/L) were 3.78, platelets (X109/L) were 195.2, monocytes (X109/L) were 0.45 and lymphocytes (X109/L) were 0.92. The mean

amylase (U/L) level was 53.6, lipase (U/L) was 31.7, creatinine kinase (U/L) was 120.4, CRP (mg/L) was 36.1 and ESR (mm/hr) was 25.9. Two studies from China reported laboratory and imaging findings of pancreatic injury in COVID-19 patients admitted in separate hospitals. Wang et al<sup>12</sup>, nine out of 52 patients (17%) had pancreatic enzyme abnormalities, with any change above the upper limit of normality being considered, and six of them (66%) also had hyperglycemia. No imaging tests were described, nor whether any of the patients had criteria for acute pancreatitis. Patients with pancreatic injury had a higher incidence of gastrointestinal symptoms, such as diarrhea and anorexia, in addition to severe disease on admission. When compared with patients without pancreatic injury, there was no difference regarding mechanical ventilation or viral clearance.

Liu et al<sup>13</sup> analyzed 121 patients admitted into hospital, 64 (52.9%) diagnosed with a severe form of COVID-19. Of these patients, 12 (18%) had pancreatic enzyme abnormalities compared to one patient (1.85%) with non-severe COVID-19. The pancreatic injury in COVID-19 might be caused directly by the cytopathic effect mediated by local SARS-CoV-2 replication. On the other hand, the pancreatic injury might be caused indirectly by systemic responses to respiratory failure or the harmful immune response induced by SARS-CoV-2 infection, which also led to damage in multiple organs. In this study, heart, liver, and renal injuries were detected simultaneously.<sup>14</sup>

## CONCLUSION

Authors found that COVID-19 infection has maximum chances of pancreatic involvement even in mild cases, hence careful assessment of biochemistry is required.

## REFERENCES

1. Patel KP, Patel KPA, Vunnam RR, et al. Gastrointestinal, hepatobiliary, and pancreatic manifestations of COVID-19. *J Clin Virol*. 2020;128:104386.

2. Garrido I, Liberal R, Macedo G. Review article: COVID-19 and liver disease-what we know on 1st May 2020. *Aliment Pharmacol Ther.* 2020;52:267-75
3. Zhou P, Yang XL, Wang XG, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature.* 2020;579:270-3.
4. Wan Y, Shang J, Graham R, Baric RS, Li F. Receptor recognition by the novel coronavirus from Wuhan: an analysis based on decade-long structural studies of SARS coronavirus. *J Virol.* 2020;94, e00127–20.
5. Pan L, Mu M, Yang P, et al. Clinical characteristics of COVID-19 patients with digestive symptoms in Hubei, China: a descriptive, cross-sectional, multicenter study. *Am J Gastroenterol.* 2020;115:766-73.
6. Jin X, Lian JS, Hu JH, et al. Epidemiological, clinical and virological characteristics of 74 cases of coronavirus-infected disease 2019 (COVID-19) with gastrointestinal symptoms. *Gut.* 2020;69:1002-9.
7. Zhang JJ, Dong X, Cao YY, et al. Clinical characteristics of 140 patients infected with SARS-CoV-2 in Wuhan, China. *Allergy.* 2020;75:1730-41.
8. Parenti DM, Steinberg W, Kang P. Infectious causes of acute pancreatitis. *Pancreas.* 1996;13:356-71.
9. Capua I, Mercalli A, Pizzuto MS, et al. Influenza A viruses grow in human pancreatic cells and cause pancreatitis and diabetes in an animal model. *J Virol.* 2013;87:597-610.
10. Schepis T, Larghi A, Papa A, et al. SARS-CoV2 RNA detection in a pancreatic pseudocyst sample. *Pancreatology.* 2020;20:1011-2.
11. Yang JK, Lin SS, Ji XJ, Guo LM. Binding of SARS coronavirus to its receptor damages islets and causes acute diabetes. *Acta Diabetol.* 2010;47:193-9.
12. Wang F, Wang H, Fan J, Zhang Y, Wang H, Zhao Q. Pancreatic injury patterns in patients with coronavirus disease 19 pneumonia. *Gastroenterology.* 2020;159:367-70.
13. Liu F, Long X, Zhang B, Zhang W, Chen X, Zhang Z. ACE2 expression in pancreas may cause pancreatic damage after SARS-CoV-2 infection. *Clin Gastroenterol Hepatol.* 2020;18:2128-30.
14. Yang JK, Feng Y, Yuan MY, et al. Plasma glucose levels and diabetes are independent predictors for mortality and morbidity in patients with SARS. *Diabet Med.* 2006;23:623-8.