Pediatric Oncall Journal
Volume : 21, Issue 4:169-173
DOI: https://doi.org/10.7199/ped.oncall.2024.42

CASE REPORTS

PANCREATITIS IN A TWO-YEAR-OLD CHILD WITH COVID-19

Joana Suarez[1], Diana Amaral[2], Isabel Afonso[3].

[1]Pediatric Cardiology Department, Hospital de Santa Marta, Centro Hospitalar Lisboa Central, Lisbon, Portugal,

[2]Pediatric Department, Hospital Dona Estefânia, Centro Hospitalar Lisboa Central, Lisbon, Portugal,

[3]Pediatric Gastroenterology Department, Hospital Dona Estefânia, Centro Hospitalar Lisboa Central, Lisbon, Portugal.

ABSTRACT

The association between COVID-19 and acute pancreatitis has been suggested. We report the clinical course of a two-year-old girl who had the diagnosis of COVID-19 and subsequently developed acute pancreatitis.

A two-year-old girl was admitted to our hospital due to severe colicky abdominal pain followed by episodes of postprandial vomiting. The physical examination revealed an epigastric pain. The laboratory findings revealed elevated liver enzymes, including gamma-glutamyl transferase with worsening scores through two consecutive evaluations. Amylase was also elevated and PCR SARS-CoV-2 on nasal secretions was positive. Hepatitis and acute pancreatitis were assumed and an exhaustive etiological investigation was performed. We suspect there was a causal relationship between the infection with SARS-CoV-2 and acute pancreatitis due to their temporal association and lack of evidence of other etiologies.

This case of acute pancreatitis in a COVID-19 patient highlights the importance of considering SARS-CoV-2 as a new etiological agent of acute viral pancreatitis.

ARTICLE HISTORY

Received 28 September 2022

Accepted 07 November 2022

KEYWORDS

Child Care, COVID-19, Pancreatitis.

Introduction

At the end of 2019 a new virus called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was identified in Wuhan, China. This virus causes COVID-19, which stands for coronavirus disease 2019. It quickly spread across the world, being characterized as a global pandemic on March 11 2020 by the World Health Organization. In children, the acute phase of the disease is most frequently asymptomatic characterized by mild upper respiratory symptoms. However, some children develop a multisystem inflammatory condition called MIS-C (a multisystem inflammatory syndrome in children) or PMIS (pediatric multisystem inflammatory syndrome). The most frequent symptoms are fever, gastrointestinal symptoms (abdominal pain, vomiting, diarrhea), rash and conjunctivitis.[1] It is not common for a COVID-19 patient to develop acute pancreatitis, but this association has been suggested over the past several months in some case reports.[1,2,3,4,5] We report the clinical course of a two-year-old girl who had the diagnosis of COVID-19 and subsequently developed acute pancreatitis.

Case Report

A two-year-old girl, born in Cabo Verde, otherwise healthy, with updated immunization schedule and no drug allergies, was admitted in a private hospital emergency department on the 25th February 2021 due to severe colicky abdominal pain followed by episodes of post prandial vomiting that had started early that day. Her mother denied fever, diarrhea, jaundice, choluria, acholic stools, respiratory or genitourinary symptoms. She also denied ingestion of herbal teas, any kind of medications or the ingestion of suspicious contaminated foods. On admission she felt nauseated and the physical examination revealed dry mucous membranes, good peripheral perfusion and an epigastric pain on superficial and deep palpation of the abdomen, without any noted masses. Initial laboratory studies demonstrated a normal white blood cell count of 11.5×109/L with 58% neutrophils, c-reactive protein (CRP) of 0.1 mg/L (reference value <5 mg/L), aspartate aminotransferase (AST) and alanine aminotransferase (ALT) were elevated to 842 U/L (reference value 21-44 U/L) and 611 U/L (reference value 9-25 U/L), respectively. Gamma-glutamyl transferase (GGT) was also elevated to 198 U/L (reference value 6-16 U/L) and Alkaline Phosphatase of 304 U/L (reference value 156-369 U/L). An abdominal ultrasound demonstrated a thin liquid slide, discrete prominence of mesenteric ganglia, distended gall bladder with thick bile, no aspects of cholecystitis, no dilation of the bile ducts and a discreet reinforcement of the portal areas. PCR SARS-CoV-2 was positive. (See Table 1 - 25th February) She was medicated with intravenous fluid therapy and an antiemetic with clinical and laboratorial improvement (AST 240 U/L, ALT 315 U/L, GGT 130 U/L) having

Address for Correspondance: Joana Suarez, Hospital de Santa Marta, Rua de Santa Marta 1169-024 Lisboa, Portugal.
Email: joana.suarez@chlc.min-saude.pt

Table 1. Summarized complementary diagnostic tests.

	25th February	4th March	4th March Admission	13th day of hospitalization, 17th March	22 days after discharge	Reference value
Hemoglobin (x10g/L)	12.3	12.3	-	11.8	12	11.5-13.5
White-cell count (x109/L)	11.5 (N 58%)	12.69 (N 70%)	-	9.2 (N 49.1%)	10.25	5-15 (N 40-75%)
Platelet count (x109/L)	282	364.000	-	371	275	200-450
Aspartate aminotransferase (AST) (U/L)	842	463	-	44	47	21-44
Alanine aminotransferase (ALT) (U/L)	611	255	-	52	12	9-25
Alkaline Phosphatase (U/L)	304	-	269	237	-	156-369
gamma-glutamyl transferase (GGT) (U/L)	198	194	-	123	32	6-16
Total Bilirubin (mg/dL)	0.36	-	-	0.15	0.17	0.2-1.2
Prothrombin time (sec)	13.7	-	14	13.2	-	10.6-11.4
INR	1.22	-	1.16	1.09	-	0.96-1.04
aPTT (sec)	36.6	-	29.5	32.5	-	24-36
Fibrinogen (g/L)	162	-	1.6	162	-	1.7-4.05
D-dimeros (µg/L)	269	-	-	-	-	<230
Total proteins (g/dL)	-	6.5	-	-	70.6	60-80
Albumin (g/dL)	-	4.1	-	-	47.8	38-54
Ammonia (mmol/L)	-	11.8	-	-	-	31-123
Blood Urea Nitrogen (mg/dL)	36	-	-	24	21	10.9-36
Creatinine (mg/dL)	0.23	0.36	-	0.47	0.44	0.32-0.54
LDH (U/L)	-	-	455	-	-	192-321
Pancreatic amylase (U/L)	-	-	1226	127	49	8-51
Lipase (U/L)	-	-	1439	289	33	4-39
Creatine kinase (U/L)	-	-	131	-	-	29-168
C-reactive protein (mg/L)	0.1	0.09	-	0.5	1	<5
Blood glucose (mg/dL)	109	94	-	-	-	60-100
Blood electrolytes	Normal	Normal	-	-	Normal	-
Capillary blood gas analysis	pH 7.37, pCO2 48 mmHg, pO2 56 mmHg, HCO3 27.7mmol/L, Lactate 1 mmol/L.	pH 7.41, pCO2 44 mmHg, pO2 56 mmol/L, HCO3 27.9 mmol/L, Lactate 1.9 mmol/L	-	-	-	-

	25th February	4th March	4th March Admission	13th day of hospitalization, 17th March	22 days after discharge	Reference value
Urinalysis	Density of 1.025, pH 7.5, positive ketone bodies; negative urobilinogen; negative bilirubin	-	-	-	-	-
PCR SARS-CoV-2	Positive	-	Negative	-	-	-
Abdominal ultrasound	"Thin liquid slide. Discrete prominence of mesenteric ganglia. Distended gall bladder with thick bile. No aspects of cholecystitis, no dilation of the bile ducts. Discreet reinforcement of the portal areas."	-	"Reinforcement of the portal triads. No focal hepatic lesions. Fine-walled gallbladder, moderately distended, without lithiasis. Dilated main bile duct, with 5 mm, without evidence of distal obstacle. Mild prominence of the intrahepatic duct. Pancreas with usual ecostructure, without dilation of the Wirsung's duct. Normal spleen dimensions, with homogeneous structure. Mild mesenteritis and ganglionic hypertrophies (smallest axis of 7 mm) in the right hypochondrium. Little amount of perihepatic ascites and in the pelvic recesses."	-	-	-

Table 2. An exhaustive etiological investigation.

Metabolic study	**Acylcarnitins , amino acids and organic acids normal**
SARS-CoV-2 antibodies	Positive
Sweat chloride	Negative
Protein electrophoresis	Total proteins 62.3 g/L, albumin 63.9%, alpha1globilin 4.6%, alfa2globulin 12.8%, beta1globulin 6.1%, beta2globulin 3.9%, gamma globulin 8.7%
IgG (g/L)	6.03
IgA (g/L)	0.51
alpha-1-antitrypsin (g/L)	1.54
Anti-hepatitis A IgG/IgM	Negative/Negative
Anti CMV IgG/IgM	Negative/Negative
EBV	EBV-VCA IgG/IgM Positive/Negative; EBV-EA IgG Negative; EBV-EBNA IgG Positive
Anti-Mycoplasma pneumoniae IgG/IgM	Negative/Negative
Salmonella, Shigella and Campylobacter in the stool	Negative
Ag adenovirus	Negative
Enterovirus in the stool	Not detected
Virus panel	Rhinovirus positive
Anti-HIV 1 + 2	Negative
PCR virus Herpes simplex 1	Negative
Autoimmunity	ANA negative, ASMA negative, LKM1 negative, Anti-cytosol1 negative, Anti-gliadin deaminated IgA + IgG negative, Ig anti-transglutaminase IgA + IgG negative
Abdominal ultrasound (March 9th)	"Pancreas of enlarged dimensions, more evident at the body where it reaches 17 mm of thickness and at the level of the tail where it reaches 21 mm in thickness, with homogeneous echostructure, without evidence of peripancreatic liquid. No dilation of the Wirsung duct. (...) Discrete subhepatic ascites. (..) Small mesenteric ganglia"
ColangioRM (March 16th)	"Globose pancreas, (..) relationship with pancreatitis. Absence of pancreatic malformations, namely pancreas divisum or annular pancreas. No evidence of pancreatic parenchymal focal lesions or dilation of the main pancreatic duct. Regular and undilated intra and extra hepatic bile ducts. Sinuous gallbladder, with a non-thickened wall and no endoluminal content. Liver with preserved dimensions and regular contour. Homogeneous liver parenchyma, with no evidence of focal lesions. (..) Absence of ascites or adenomegalies"

been discharged after one day of hospitalization. On March the 2nd she had a scheduled medical appointment for reevaluation. The physical examination was normal and blood tests revealed improvement of the liver scores (AST 45 U/L, ALT 85 U/L, GGT 92 U/L), negative serum markers for acute hepatitis A, B and C and no active acute infection for EBV, CMV and enterovirus. On March the 4th, similar symptoms of severe colicky abdominal pain and multiple episodes of postprandial vomiting restarted. Once again fever, diarrhea, jaundice, choluria, acholic stools, respiratory or genitourinary symptoms were denied as well as suspicious ingestions. She was readmitted and the physical examination revealed a sleepy and nauseated young girl, with dry mucous membranes, good peripheral perfusion, but no areas of tenderness or masses upon abdominal examination. The laboratory findings on this day revealed worsening of liver scores, with AST 463 U/L, ALT 255 U/L and GGT 194 U/L. PCR of 0.09 mg/L. (See Table 1 - 4th March) She was transferred to our hospital to be hospitalized for surveillance and etiological investigation. Upon admission the laboratorial investigation was complemented. Pancreatic amylase and lipase were high to 1226 U/L and 1439 U/L, respectively. An abdominal ultrasound demonstrated a reinforcement of the portal triads, fine-walled gallbladder, moderately distended, without lithiasis; dilated main bile duct, with 5 mm,

without evidence of distal obstacle; pancreas with usual ecostructure, without dilation of the Wirsung's duct; mild mesenteritis and ganglionic hypertrophies (smallest axis of 7 mm) in the right hypochondrium; little amount of perihepatic ascites and in the pelvic recesses." (See Table 1 - 4th March Admission) Hepatitis and acute pancreatitis were assumed, so the diet was stopped and she was put on fluid therapy and intravenous analgesics. During all the course of the hospitalization, she remained apyretic and hemodynamically stable. On the 4th day of hospitalization oral feedings were restarted, but there was clinical worsening, with abdominal pain and nausea, without vomiting, coinciding with analytical aggravation - AST 266 U/L (previous 139), ALT 164 U/L (previous 164), GGT 219 U/L (previous 135), Amylase 726 U/L (previous 711), lipase 3442 U/L (previous 1494). Fluid therapy was reinforced, maintaining a low-fat diet and ursodeoxycholic acid was started, first with clinical and subsequently with laboratorial improvement. An exhaustive etiological investigation was performed, as listed in Table 2.

On the 13th day of hospitalization, she was discharged, maintaining clinical stability and with clear analytical improvement (see Table 1-13th day of hospitalization, 17th March)

She had a medical appointment for reevaluation 22 days after discharge. She remained apyretic, without vomiting or abdominal pain. Her mother denied choluria or acholic stools. Physical examination was normal and the complementary diagnostic tests are summarized in Table 1-22 days after discharge.

Discussion

The authors report a case of acute pancreatitis in a post COVID-19 patient, highlighting the importance of considering SARS-CoV-2 as a new etiological agent of acute viral pancreatitis. The diagnosis of pancreatitis in this child was based on abdominal pain and amylase elevated over 3 times the upper limit of normal. Acute pancreatitis (AP) in pediatric patients is most commonly caused by drugs, trauma and gallstones. However, viral pancreatitis has been well-described in the literature, with causative virus such as CMV, HIV, EBV, mumps, measles, coxsackie virus, Epstein-Barr Virus or Hepatitis-A virus identified.[1] Though there was no direct evidence of viral pancreatitis in this case, we suspect there was a causal relationship between the infection with SARS-CoV-2 and acute pancreatitis due to their temporal association and lack of evidence of other etiologies. The clear pathogenesis of acute pancreatitis in COVID-19 patients is still unknown. The mechanism of AP following viral infections depends on the type of the virus involved. There is some evidence showing SARS-CoV-2 enters cells in the lungs and also in the gastrointestinal system by binding to the angiotensin-converting enzyme 2 (ACE2) which may provide a possible pathophysiologic explanation for gastrointestinal symptoms experienced by some patients. ACE2 is highly expressed in the pancreas, in both the islet cells and the exocrine portions[4], indicating the pancreas as a potential SARS-CoV-2 target. AP could occur due to direct cytopathic effect of local virus replication which may cause increased thrombophilia in pancreas vessels and this vascular thrombosis may lead to AP. On the other hand, AP may also occur by the indirect effect of the harmful systemic immune response induced by SARS-CoV-2.[1,5] Physicians should be aware of asymptomatic or mildly gastrointestinal symptomatic patients with COVID-19 require pancreatic enzymes and even abdomen imaging to diagnose pancreatitis. This diagnosis is important for adequate treatment and better management of systemic repercussions, such as SIRS (Systemic inflammatory response syndrome), decreasing SARS-CoV-2 mortality. Further studies are needed to establish the real prevalence and clinical significance of pancreatic injury in COVID-19 patients.

Compliance with Ethical Standards
Funding : None
Conflict of Interest : None

References

1. Bineshfar, N., Mirahmadi, A., Karbasian, F., Pourbakhtyaran, E., Karimi, A., & Sarafi, M. (2021). Acute Pancreatitis as a Possible Unusual Manifestation of COVID-19 in Children. Case Reports in Pediatrics, 2021, 1-4.
2. Suchman, K., Raphael, K. L., Liu, Y., Wee, D., & Trindade, A. J. (2021). Acute pancreatitis in children hospitalized with COVID-19. Pancreatology, 21(1), 31-33.
3. Stevens, J. P., Brownell, J. N., Freeman, A. J., & Bashaw, H. (2020). COVID-19-associated Multisystem Inflammatory Syndrome in Children Presenting as Acute Pancreatitis. Journal of Pediatric Gastroenterology & Nutrition, 71(5), 669-671.
4. Samies, N. L., Yarbrough, A., & Boppana, S. (2020). Pancreatitis in Pediatric Patients With COVID-19. Journal of the Pediatric Infectious Diseases Society, 10(1), 57-59.
5. Wang, F., Wang, H., Fan, J., Zhang, Y., Wang, H., & Zhao, Q. (2020). Pancreatic Injury Patterns in Patients With Coronavirus Disease 19 Pneumonia. Gastroenterology, 159(1), 367-370.