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Case Report

Acute pancreatitis following Pfizer-BioNTech COVID-19 vaccine

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ABSTRACT

The coronavirus disease of 2019 (COVID-19) discovered in China in early December 2019. The Saudi Food and Drug Authority approved the registration of the Pfizer-BioNTech COVID-19 vaccine in Saudi Arabia on December 10, 2020, and on May 10, 2021, Pfizer-BioNTech was given emergency authorization for use of the vaccine in children aged 12 to 15 years. Saudi Arabia's Ministry of Health started the vaccination phase for ages 12 to 18 years for the Pfizer-BioNTech COVID-19 vaccine on June 27, 2021. An insulin-dependent diabetic 15-year-old female patient admitted to the medical ward diagnosed with acute pancreatitis nine days after being administered her first dose of the Pfizer-BioNTech COVID-19 vaccine. She presented with an amylase level of 340 U/L, lipase level of 937 U/L. She was discharged after eight days of hospitalization with no complications. Medical investigations were unable to link the diagnosis to any known etiology. Medical journals have reported numerous cases of acute pancreatitis in the adult population after Pfizer-BioNTech COVID-19 vaccination. We believe that our case is the first to present with acute pancreatitis after the first dose of the Pfizer-BioNTech COVID-19 vaccine in a teenager population.

Keywords: Pfizer-BioNTech, Vaccine, Acute pancreatitis, Teenager

INTRODUCTION

The coronavirus disease of 2019 (COVID-19) discovered in China in early December 2019,[1] and on November 20, 2020, an emergency use authorization was submitted by Pfizer and BioNTech for preventing COVID-19 in individuals 16 years of age and older.[2] By December 11, 2020, the U.S. Food and Drug Administration had issued an emergency use authorization for vaccines to prevent COVID-19.[3,4] On May 10, 2021, Pfizer-BioNTech was granted an emergency authorization for use in individuals aged 12–15 years.[4] The Saudi Food and Drug Authority approved the registration of the Pfizer-BioNTech COVID-19 vaccine in Saudi Arabia on December 10, 2020.[5] The Saudi Arabia Ministry of Health started the vaccination phase for individuals aged 12–18 years using the Pfizer-BioNTech COVID-19 vaccine on June 27, 2021.[6]

CASE REPORT

This case concerns a 15-year-old female patient with known insulin-dependent diabetes since the age of 7 years, with no history of allergic reactions to drugs or vaccines. The patient was administered the first dose of the Pfizer-BioNTech COVID-19 vaccine on July 30, 2021. On August 8, 2021, she developed abdominal pain (epigastric, sharp, non-radiating, progress,

aggravated by movement, and with no relieving factors), which was associated with nausea and vomiting. The patient had no history of fever, acute pancreatitis, blood transfusion, hemodialysis, and recent contact with an infected individual, trauma, smoking, alcohol intake, abdominal surgery, medical procedures, use of new medication, use of herbal supplements, or changes in diet. COVID-19 nasopharyngeal swab for RT-PCR testing was taken 2 days before presentation to emergency department results were negative. The physical examination revealed that the patient's vital signs were within normal limits. However, she exhibited epigastric tenderness with normal bowel sounds. On August 9, 2021, the patient was admitted with acute pancreatitis, diabetic ketoacidosis, and acute hepatitis.

The laboratory results on the 1st day of admission were as follows: Metabolic acidosis, unremarkable complete blood count, amylase level 340 U/L, lipase level 937 U/L, alanine aminotransferase (ALT) level 785.9 U/L, aspartate aminotransferase (AST) level 4025 U/L, triglyceride level 5.7 mmol/L, and calcium level 2.57 mmol/L [Table 1]. After 8 days of hospitalization, the patient was discharged with the following laboratory results: ALT 373 U/L, AST 597 U/L, amylase 315 U/L, and lipase 426 U/L.

The radiological findings of the abdominal ultrasound indicated a fatty liver enlarged to 19.2 cm, no focal lesion, no intrahepatic biliary radical dilatation, patent non-dilated portal vein, contracted gallbladder, non-dilated common bile duct, normal-looking pancreas, normal spleen, and no free fluid in the abdominal or pelvic cavity [Figure 1].

Table 1: Laboratory investigations with normal range used by the hospital

Test	Patient value	Normal range	Units
PH	7.2	7.35–7.45	
pCO_2	23	35–48	mmHg
HCO_3	9	21–28	mmol/L
WBC	9.4	4–10	10*3/uL
HGB	14.5	12–15	g/dL
MCV	79.8	83–101	fL
MCH	29	27–32	pg
PLT	402	150–400	10*3/uL
HCT	39.9	40–50	%
Na	138	136–145	mmol/L
K	3.7	3.5–5.1	mml/L
Ca	2.57	2.2–2.7	mmol/L
Cl	100.2	98–106	mmol/L
Phosphorus	1.32	1.12–1.45	mmol/L
Mg	0.76	0.84–1.1	mmol/L
Lactate	2.94	0.5–1	mmol/L
LDH	1324	140–290	U/L
Urea	6.5	2.1–8.5	mmol/L
Crea	75	44–80	umol/L
ALT	785.9	16–63	U/L
AST	4025	15–37	U/L
GGT	314	10–51	U/L
T. bilirubin	5	1.7–20.5	umol/L
D. bilirubin	2.1	<5.1	umol/L
Albumin	29.7	34–54	g/L
ALP	146	44–147	U/L
Amylase	340	30–110	U/L
Lipase	937	14–140	U/L
T. cholesterol	6.98	<5.17	mmol/L
Triglyceride level	5.7	<2.2	mmol/L
LDL	4.4	<2.6	mmol/L
HDL	0.7	>1.5	mmol/L
HbA1C	13.4		%
CRP	0.257	<0.3	mg/dL
TSH	2.61	0.3–4.2	mlU/L
T3	2.79	2.0–5.2	pmol/L
T4	10.3	10–23	pmol/L
HBsAg	Non-reactive		
HBcAb (IgM)	Non-reactive		
Anti HAV (IgM)	Non-reactive		
Anti HCV	Non-reactive		
ESR	38	0–20	mm/h

WBC: White blood cell, ALT: Alanine aminotransferase, AST: Aspartate aminotransferase, HBsAg: Hepatitis B surface antigen, HBcAb: Hepatitis B core antibody, Anti-HAV IgM: Anti-hepatitis A virus IgM, Anti-HCV: Anti-hepatitis C virus

DISCUSSION

Acute pancreatitis refers to the inflammation of the pancreas,[7] with most cases in Saudi Arabia having a biliary origin.[7,8] The etiologies of acute pancreatitis include alcohol use, gallstones, hypertriglyceridemia, idiopathic origin, drug-induced, smoking, trauma, hypercalcemia, systemic IgG4 disease, viral/bacterial/parasitic infection, ampullary stenosis (sphincter of Oddi dysfunction), annular pancreas, hemodialysis, post-endoscopic retrograde cholangiopancreatography, and post-abdominal surgery, all of which should be ruled out by the patient's medical history.[9] In the diagnosis of acute pancreatitis, at least two of the following three criteria are required: (1) Abdominal epigastric pain radiating to the back; (2) lipase or amylase levels three-fold the upper limit of normal; and (3) radiological imaging suggestive of acute pancreatitis.[9] For triglycerides to be identified as a risk factor for acute pancreatitis, the levels should be >1000 mg/dL (11.3 mmol/L).[10] Diabetic ketoacidosis can be linked to acute pancreatitis, which can be induced by hypertriglyceridemia[11,12] and was ruled out in this patient, given that her triglyceride level was 5.7 mmol/L. Gallstones, annular pancreas, and ampullary stenosis could be ruled out in our patient due to the normal direct bilirubin and alkaline phosphatase levels and no previous history of acute pancreatitis.[13] Normal calcium levels can rule out acute pancreatitis due to hypercalcemia.[14,15] No signs of viral/bacterial/parasitic infections were observed in this case, given that the patient had an unremarkable complete blood count, with a normal white blood cell count and no history of fever.

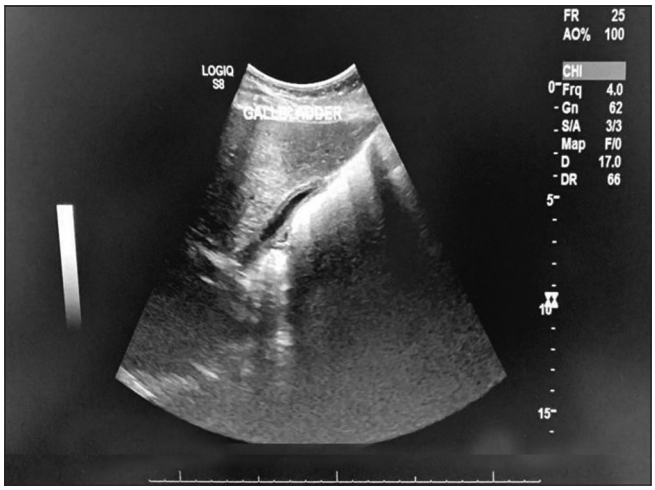

Figure 1: Abdominal Ultrasound shows contracted gall bladder without presence of stones.

Study limitations

Systemic IgG4 disease in causing acute pancreatitis cannot be ruled out given that no laboratory investigation (IgG4 level) was available at the institution.

CONCLUSION

Our 15-year-old patient was diagnosed with acute pancreatitis 9 days after being administered the first dose of the Pfizer-BioNTech COVID-19 vaccine. We publish our case for health administrations and medical professionals to weigh the risks versus benefits in this age group, especially after developing serious medical conditions following the first dose of the vaccine.

Authors' contributions

Study conception, AA, and GB; review and editing, AA, GB, and AK; data collection and extraction, AS; supervision, AK, and GB; treating medical team; AK.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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