



Type 2 Diabetes, Chronic Kidney Disease and Now Developing Liver Disease

Jason Kutz, MLS; Masih Shokrani, Ph.D. MT (ASCP)

Medical Laboratory Sciences Program/ Northern Illinois University

ABSTRACT

Type 2 diabetes is a chronic disorder that leads to long-term complications and damage to many organs, including the kidneys. Obesity is considered a major cause of type 2 diabetes and subsequent fatty liver development. This actual clinical case depicts the condition of a 65-year-old obese male patient with a history of type 2 diabetes who was admitted to the emergency room because of his symptoms, such as epigastric pain. Tests that were ordered for the patient included ultrasound, computed tomography (CT) scan, and chemistry tests, along with blood and urine tests upon admission and for follow-up tests. A hepatic steatosis could be diagnosed with the increased Alanine aminotransferase (ALT), Aspartate aminotransferase (AST) values, but no echogenicity was noted for the patient's liver. Specifically, Alkaline phosphatase was within normal levels. The chemistry results which correlated with the CT scan indicated a fatty liver, but more tests needed to be done to confirm this diagnosis. Because the findings on the CT scan along with increased ALT and AST values indicated hepatitis, future tests need to include screening for viral hepatitis and hyperlipidemia to determine whether the hepatitis was due to viral infection or simple liver steatosis. Additionally, the renal cyst which was seen on previous images should be reimaged to determine the presence of any new growth or change in appearance. The patient's glomerular filtration rate should also be monitored to evaluate any further diminished kidney function. Due to the unresolved cause of the hepatitis, and the lack of noticeable obstructions, the patient's liver function should be reevaluated once there are no more symptoms. Because of previous type 2 diabetes, the patient's symptoms were notably related to obesity and unhealthy eating habits, including excess sugar intake. Advice for this patient would include a healthy diet, weight reduction and treatment with glucose-lowering medications.

INTRODUCTION

* 65-year-old obese and diabetic male with a history of type-2 diabetes & diverticular disease admitted to the hospital because of epigastric pain & excessive vomiting.

* Diabetes Mellitus: characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. Type 2, non-insulin dependent.¹

* Type 2 diabetes is more common and is found in patients who are overweight or obese or have an increased percentage of body fat distribution in the abdominal region.¹

* Diabetes Mellitus: characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both.¹ Chronic complications of uncontrolled blood sugar in diabetic patients lead to increased risk for damage to heart, kidneys (diabetic nephropathy), eyes, peripheral nerves, blood vessels, eye, foot, and hearing.²

* Obesity and sedentary life style are considered the main risk factors for nonalcoholic fatty liver disease (NAFLD). NAFLD may progress to nonalcoholic steatohepatitis.³

INITIAL & FOLLOW-UP RESULTS

* Ultra Sound, CT scan, complete blood count (CBC), liver function test, urine test, Influenza A or B tests were ordered.

* Ultra Sound results: the liver increased in size, the gallbladder mildly distended, no evidence of intrahepatic biliary dilation or solid/cystic masses, no obstruction of liver or gallbladder observed, the pancreas had an increase in echogenicity but no solid/cystic masses on ductal dilation were seen.

* CT results: no free air or fluid, scattered diverticula seen on distal colon, gallbladder was distended, a mass off the right posterior kidney seen, mild atherosclerotic vascular calcifications of the kidneys seen.

* CBC, Serology & Urinalysis results: all the values for the CBC & urinalysis normal, but low values for CBC on follow up tests; the tests for influenza A & B were negative.

* Chemistry results: high glucose results; total protein, serum albumin & estimated glomerular filtration rate (GFR) were all low; increased AST & ALT on follow-up tests with ALT/AST ratio >1, but Alkaline phosphatase in normal range.

TEST	RESULTS 2/6	Result 2/5	H/L	RANGE
• WBC	4.2 K/uL	6.1 K/uL	(low)	4.3-11K/uL
• RBC	3.89 M/uL	4.7 M/uL	(low)	4.6-6.2M/uL
• HGB	11.6 g/dl	14.0 g/dl	(low)	14-18 g/dl
• HCT	35.7 %	42.8 %	(low)	40-50 %
• Platelet	113 K/uL	159 K/uL	(low)	150-375K/uL

Table 1: Initial and follow-up CBC results

TEST	RESULTS 2/6	Result 2/5	H/L	RANGE
BUN	14 mg/dl	25 mg/dl	normal	8-23 mg/dl
Creatinine	1.04 mg/dl	1.38 mg/dl	normal	.66-1.25 mg/dl
POC glucose	120 mg/dl	179 mg/dl	(high)	75-99 mg/dl
Glucose	172 mg/dl	232 mg/dl	(high)	75-99 mg/dl
Calcium	8.2 mg/dl	8.8 mg/dl	(low)	8.4-10.2mg/dl
Total protein	5.9 g/dl	6.7 g/dl	(low)	6.3-8.2 g/dl
Albumin	2.7 g/dl	3.3 g/dl	(low)	3.5-5 g/dl
A/G ratio	.8	1.0	(low)	1.1-2.2
ALT (SGPT)	61 U/L	75 U/L	(high)	10-40 U/L
AST (SGOT)	47 U/L	61 U/L	(high)	8-33 U/L
Alkaline Phos	51	65mU/L	normal	38-126U/L
Lipase	NT	13 U/L	NT	22-51 U/L
Lactic Acid	NT	2.3mmol/L	NT	0.5-2.0 mmol/L
EGFR	72 ml/min/173m ²	52 ml/min/173m ²	(low)	90-120

Table 2: Initial and follow-up chemistry results

CONCLUSION/DISCUSSION

* The CBC results on follow-up tests consistent with the patient's weakened condition. The results of the patient's serum and CT images indicate uncontrolled diabetes while a hepatic steatosis could be considered with increased ALT & AST levels; gallbladder should not be considered the cause of patient's symptoms; the most likely cause of reduced serum total protein, albumin and EGFR due to diabetic nephropathy.

* Cause of hepatitis needs further investigation; the right renal cyst needs to be reimaged; EGFR needs to be monitored; patient's liver tests needs to be rechecked; patient's symptoms related to obesity, uncontrolled type 2 diabetes, and unhealthy eating habits. Life style changes & diabetes medications are indicated for this patient.

REFERENCES

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