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CASE REPORT: MULTIPLE LIVER NODULES DUE TO TYPE 2 DIABETES MELLITUS IN A 55-YEAR-OLD MALE PATIENT

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ABSTRACT

Hepatic cirrhosis is characterized by fibrosis and formation of liver nodules caused by chronic injury, causing changes in the normal lobular organization of the heart. Hepatic cirrhosis can occur in all genders and about two-thirds occurs in men and one part in women. Diabetic patients can experience insulin resistance, which can be the basis for the development of complications into liver cirrhosis. This case study describes a 55 year old male patient who was diagnosed with hepatic cirrhosis with diabetes mellitus and discussed the course of the disease to the therapy given to the patient. A 55 year old male patient came with complaints of shortness of breath that had been felt for 3 months before entering the hospital. Based on the history, physical examination and search, the patient was diagnosed with liver cirrhosis, multiple liver nodules, type 2 diabetes mellitus and pulmonary tuberculosis. Hepatic cirrhosis can be caused by various diseases, one of which is diabetes mellitus. Diabetes can progress to nonalcoholic fatty liver disease and eventually to cirrhosis and hepatocellular carcinoma. Insulin resistance syndrome is the main factor that can cause cirrhosis in diabetes patients. Early diagnosis, resistance and control of risk factors as well as appropriate treatment also play an important role in reducing the damage to the prognosis of patients with hepatic cirrhosis due to diabetes mellitus.

KEYWORDS *Hepatic Cirrhosis, Diabetes Mellitus, Liver Nodules, Case Report*

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INTRODUCTION

Hepatic cirrhosis is characterized by fibrosis and nodule formation in the liver due to chronic injury that causes changes in the normal lobular organization of the liver (Sharma & John, 2022). Nodules in cirrhosis hepatis can be considered as hepatocellular carcinoma until proven by ultrasonogram as the initial examination and then computerized tomography and magnetic resonance imaging (Rao, 2014).

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Chronic liver disease usually progresses to cirrhosis hepatis. The most common causes of hepatic cirrhosis in developed countries are hepatitis C virus (HCV), alcoholic liver disease, and nonalcoholic steatohepatitis (NASH), while the most common causes in developing countries are hepatitis B virus (HBV) and HCV. Other causes of cirrhosis include autoimmune hepatitis, primary biliary cholangitis, primary sclerosing cholangitis, hemochromatosis, Wilson's disease, insulin resistance, alpha-1 antitrypsin deficiency, Budd-Chiari syndrome, drug-induced hepatic cirrhosis, and right-sided chronic heart failure. Cryptogenic cirrhosis is defined as cirrhosis whose etiology is unclear (Sharma & John, 2022; Suva, 2014).

Hepatic cirrhosis can occur in all genders and about two-thirds occur in men and one-third in women (Cheemerla & Balakrishnan, 2021). In 2019 liver cirrhosis was associated with 2.4% of deaths globally (Huang et al., 2023). Based on data from the 2022 performance report by the Directorate of Infectious Disease Prevention and Control of the Ministry of Health, liver cirrhosis affects around 1.4 million people per year and is one of the eight diseases that have high financing (Kementerian Kesehatan RI, 2022).

The liver has an important role in carbohydrate metabolism as it is responsible for the balance of blood glucose levels through the processes of glycogenogenesis and glycogenolysis. In liver disease, glucose metabolic homeostatis is disrupted due to disorders such as insulin resistance, glucose intolerance, and diabetes. Insulin resistance occurs not only in muscle tissue, but also in adipose tissue, and this combined with hyperinsulinemia appears to be an important pathophysiological basis of diabetes in liver disease. Patients who have both hepatic cirrhosis and diabetes have complications that can lead to death (Garcia-Compean et al., 2009). This case study describes a 55-year-old male patient who has been diagnosed with hepatic cirrhosis with diabetes mellitus discussed from the course of the disease to the therapy given to the patient.

RESEARCH METHOD

Case Report

A 55-year-old male patient presented with complaints of shortness of breath that had been felt since 3 months before admission (SMRS). Tightness was felt continuously and there were no factors that aggravated or alleviated the tightness. The patient also complained of difficulty defecating. Defecation was hard in consistency with black feces and small round shapes for 3 months SMRS. The patient also felt nausea, which decreased the patient's appetite and made the patient feel that he had lost a lot of weight. Complaints were also accompanied by an enlarged abdomen since 3 months ago which felt like there was water in the stomach. The patient's legs felt numb and the patient felt that there were often many sores on the legs that were not painful and the wounds were difficult to heal which had been felt since the last 5 months. The patient also felt thirsty and hungry continuously but could not eat much, the patient also often woke up at night to urinate. Complaints of frequent thirst, hunger and nighttime urination have been felt since the last 8 years but the patient ignores these complaints. Other complaints such as cough, runny nose, vomiting blood, bloody stools, mucous stools were denied. The patient had a history of uncontrolled diabetes mellitus, diagnosed since 9 months SMRS, a

history of congestive heart failure (CHF) since 5 months SMRS and a history of liver cirrhosis since 5 months SMRS. The patient's family had no similar complaints, family history of diabetes mellitus was denied. The patient smokes 1 pack per day and has started smoking since a young age. The patient's diet often consumes fatty foods such as fried foods and coconut milk. The patient has never taken routine medications for the disease.

Physical examination obtained vital signs of blood pressure 140/100 mmHg, pulse 90x/min, temperature 36.0°C and breathing 23x/min. After examination of the system, it was found that there were icteric sclera in both eyes, ronkhi in both lung fields, abdominal examination obtained distension, spider naevi (+), decreased intestinal noise, faint percussion in all abdominal fields, shifting dullness (+), fluid wave (+), tenderness in the hypochondriac region dextra and sinistra, palpable hepatic nodules 2 fingers below the arcus costae dextra and nodule-like mass 5 fingers below the arcus costae dextra. Examination of the extremities revealed cold acral, capillary refill time of 3 seconds, palmar erythema, lower leg edema and wound on the left foot. Other examinations performed were within normal limits.

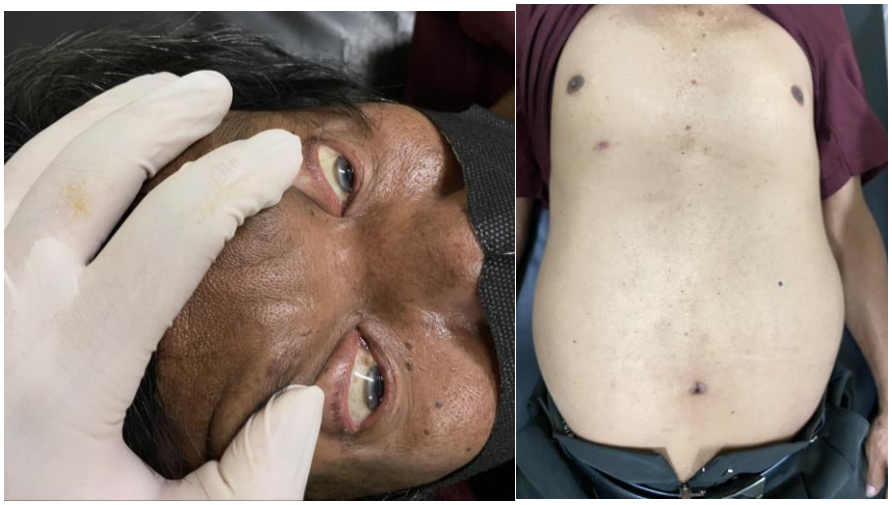


Figure 1. Icteric Sclera (Left) and Abdominal Distension (Right)

Figure 2. Palmar Eritema (Left) and DM Wound on Regio Cruris Sinistra (Right)

Laboratory examination was performed on the patient and found a decrease in hemoglobin (12.4 g/dL), a decrease in hematocrit (41.9%), an increase in fasting blood sugar (109 mg/dL), an increase in HbA1C (7.6 g/dL). Radiologic examination of the thorax X-ray showed an increase in cardiothoracic ratio, increased bronchovascular cores in both hemithorax, fibrosis, pleural effusion dextra and sinistra.

Table 1. Blood laboratory on 1/12/22

Parameter	Result	Reference value	Unit
A. Hematology			
Routine Blood			
- Hemoglobin	12.4*	13,2 – 17,3	g/dL
- Hematocrit	41.9*	45 - 52	%
- Leukocytes	7.1	4 – 11	10^9L
- Trombosit	175	150 – 440	Ribu/µL
B. Kimia			
Blood Sugar (IGD)	202	80-120	mg/dL
Timed Blood Sugar	195	80 - 120	mg/dL
Ureum	35.3	10.0 – 50.0	mg/dL
Creatinine	0.74	0.60 – 1.30	mg/dL
SGOT	16	0 – 50	U/L
SGPT	11	3.5 – 5.50	U/L
Albumin	2.99	135 – 145	g/dL
Na,K,Cl			
- Natrium	135	135 – 145	mEq/L
- Kalium	3.7	3.5 – 5.3	mEq/L
- Clorida	110	95 – 106	mEq/L
E. Immunoserology			

Ag SARS CoV2	NEGATIVE	NEGATIVE	

Table 2. Blood Laboratory on 02/12/22

Parameter	Result	Reference value	Unit
B. Chemistry			
Fasting Blood Sugar	109*	74 – 106	mg/dL
HbA1C	7.6*	0 – 5.7	g/dL

Table 3. Blood Laboratory on 08/12/22

Parameter	Result	Reference value	Unit
E. Immunoserology			
HBSAg	Non Reactive	Non Reactive	-

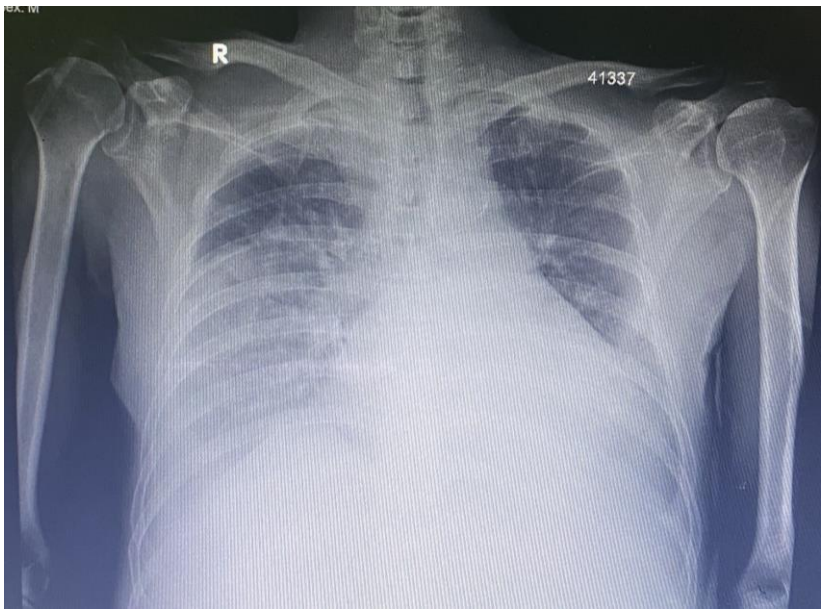


Figure 3. Thorax AP Projection Photo

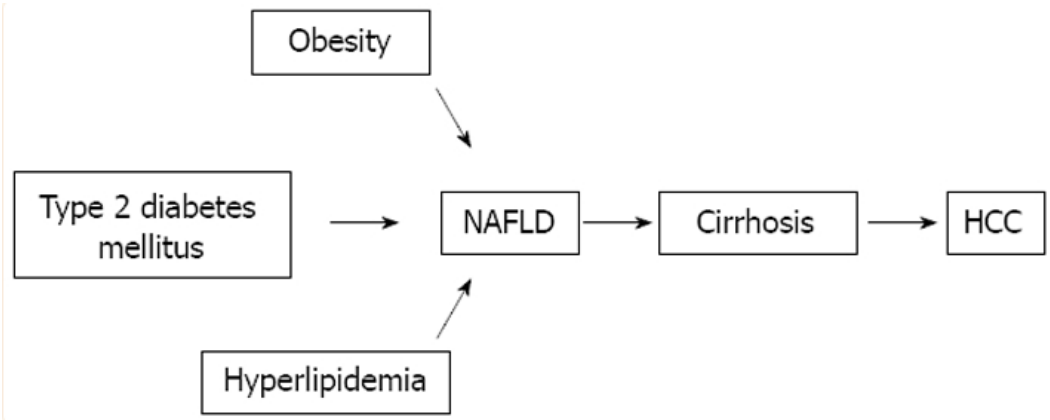
Based on anamnesis, physical examination and support, the patient was diagnosed with cirrhosis hepatis, multiple hepatic nodules, type 2 diabetes mellitus and pulmonary tuberculosis. The patient was given initial management in the emergency room with NGT insertion, Omeprazole injection 2x40 mg, Ondansentron injection 2x8 mg, Ceftriaxone injection 2x1 g, Furosemide injection 2x20 mg, Spironolactone injection 1x100 mg, Ketorolac injection 2x30 mg, Paracetamol per oral 3x500 mg, Gabapentin per oral 1x300 mg, Curcuma per oral 3x1, Lactulac per oral 3x1, Channa per oral 3x2. After initial treatment, the patient was admitted to the ward and given further management of Ceftriaxone injection 2x1 g, Furosemide injection 2x10 mg, Gabapentin per oral 1x300 mg, Fluimucyl per oral 3x200 mg, Spironolactone per oral 1x25 mg, Kurkumex per oral 3x1 tab, Channa albumin per oral 500mg 3x2 tab, Paracetamol per oral 3x500mg, metformin per oral 1x500mg, anti-tuberculosis Fixed Drug Combination (OAT FDC) 1x4 tab, vitamin B6 per oral 1x1. After treatment for 7 days, the patient was discharged

home with Gabapentin 1x100 mg, Channa Albumin 3x500 mg, Kurkumex 2x1, Omeprazole 1x20mg, OAT FDC 1x4 tabs.

RESULT AND DISCUSSION

Discussion

Cirrhosis is defined as the histologic development of regenerative nodules surrounded by fibrous tissue in response to chronic liver damage (Schuppan & Afdhal, 2008). The causes of liver cirrhosis are chronic liver disease, chronic hepatitis B and C, nonalcoholic fatty liver disease (NAFLD), primary biliary cirrhosis, primary sclerosing cholangitis, autoimmune hepatitis, hereditary hemochromatosis, Wilson's disease, alpha 1-antitrypsin deficiency, cardiac cirrhosis, galactosemia, cystic fibrosis, drug or toxin-induced hepatotoxicity, certain parasite infections (schistomiosis) (Jameson, Fauci, Kasper, Hauser, Longo, 2019). In this case, the patient was found to have cirrhosis hepatis caused by diabetes mellitus. This is because the patient's only medical history is type 2 diabetes mellitus. Hepatic cirrhosis caused by diabetes mellitus is associated with the previous occurrence of NAFLD (Asdie et al., 2017).



Type 2 diabetes mellitus can cause nonalcoholic fatty liver disease which can progress to cirrhosis and hepatocellular carcinoma (Garcia-Compean et al., 2009)

The incidence of NAFLD is significantly higher in patients with diabetes mellitus than in non-diabetic patients. This risk is said to be twofold greater and is independent of the occurrence of alcoholic fatty liver and viral hepatitis. In diabetes mellitus where there is a state of insulin resistance, it will encourage the release of free fatty acids from tissues so that they accumulate in hepatic cells. This will lead to reduced production of very low density lipoprotein by the liver which will saturate hepatosis which will lead to steatosis (Garcia-Compean et al., 2009). Increased mitochondrial oskidative stress caused by excess triglycerides will trigger the release of free radicals, increase the excess production of intracellular free fatty acids, increase the excess of adipokines (adipocyte-derived cytokines) such as TNF alpha and adiponectin deficiency allows for the creation of an adipokine environment of inflammation and cellular necrosis. The resulting inflammation

stimulates cellular inflammation and necrosis resulting in fibrosis (Garcia-Compean et al., 2009; Li et al., 2019).

Type 2 diabetes mellitus is a risk factor for the development of fibrosis. It is known that there is a strong relationship between the components of insulin resistance syndrome and the stage of hepatic fibrosis. Previously, it was debated whether type 2 diabetes mellitus could independently influence the development of hepatic fibrosis or whether it should be combined with other metabolic syndromes. (Li et al., 2019). Research conducted by Elkrief et al. included several groups observed that type 2 diabetes mellitus is associated with a 2 - 2.5-fold increased risk of hepatic cirrhosis and death from chronic liver disease caused by NAFLD and is independent of metabolic syndrome (Elkrief et al., 2016).

The existing theories are in accordance with the patient's situation, where the patient has no history of obesity so that only diabetes mellitus is known to be an independent factor in the occurrence of cirrhosis in this patient. In addition, the patient also admitted to having a history of eating fatty and coconutty foods, so it is possible that the patient has high cholesterol levels which can together with diabetes mellitus be a contributing factor to liver cirrhosis. However, this patient was not checked for cholesterol, so it is not known whether this patient has hypertriglyceridemia as well or not. Regardless, diabetes mellitus could still be an independent factor for liver cirrhosis in this patient. The patient also denied a history of alcohol consumption and a previous history of hepatitis, which was confirmed by laboratory tests, making it more evident that the patient had liver cirrhosis caused by type 2 diabetes mellitus.

The patient showed various signs and symptoms such as ascites, spider navi, palmar erythema and hepatosplenomegaly which are typical signs of liver cirrhosis. The appearance of ascites and hepatosplenomegaly in this patient proves that portal hypertension has occurred which indicates that the patient has decompensated hepatic cirrhosis (Asdie et al., 2017). This is in accordance with the theory that the presence of type 2 diabetes mellitus and liver cirrhosis in the same patient will increase the risk of decompensate (Coman et al., 2021). In addition, the occurrence of ascites in this patient could also be due to his type 2 diabetes mellitus. Research conducted by Elkrief et al. shows that diabetes mellitus is directly related to the development of ascites at the time of inclusion as well as during the treatment period (Elkrief et al., 2016). Spider navi showed elevated estradiol and palmar erythema indicating that there was a metabolic disorder of sex hormones. The patient also showed icteric sclera which could be related to elevated bilirubin. Elevated bilirubin in patients is associated with impaired liver function and further proves that this patient has advanced liver cirrhosis and has an unfavorable prognosis (Asdie et al., 2017). Laboratory examination showed anemia and hypoalbuminemia which are signs of decreased synthesis function in the liver. The results of this examination are in accordance with existing theory. Liver biopsy is the gold standard for diagnosing liver cirrhosis and assessing the degree of inflammation (grade) and fibrosis (stage) of the disease (Sharma & John, 2022), but in this case no liver biopsy was performed due to limitations.

The patient's type 2 diabetes mellitus was recognized based on his classic symptoms such as frequent thirst, hunger and increased urination frequency

accompanied by weight loss. Another sign is the wound on the patient's leg which took a long time to recover is also a supporting factor for this patient to have diabetes mellitus. The results of the patient's temporal blood sugar examination also increased so that it was in accordance with the theory in diagnosing type 2 diabetes mellitus in this patient (PERKENI, 2019).

The therapy given to this patient was Ceftriaxone injection 2x1 g, Furosemide injection 2x10 mg, Gabapentin per oral 1x300 mg, Fluimucyl per oral 3x200 mg, Spironolactone per oral 1x25 mg, Kurkumex per oral 3x1 tab, Channa albumin per oral 500mg 3x2 tab, Paracetamol per oral 3x500mg, metformin per oral 1x500mg, anti-tuberculosis Fixed Drug Combination (OAT FDC) 1x4 tab, vitamin B6 per oral 1x1. All of these therapies provided are in accordance with existing theories to help patients in the process of improving their disease according to the disease they suffer.

The occurrence of type 2 diabetes mellitus and liver cirrhosis at the same time indicates multiple pathological disorders in the liver which directly increase morbidity and mortality in patients (Coman et al., 2021). Ramachandran et al. in their research wrote that various studies have shown that the combination of these two diseases is associated with a high incidence of severe liver cirrhosis complications and decreased survival success (Ramachandran et al., 2017). In accordance with the existing theory, along with several comorbidities present in the patient, it can be concluded that the prognosis of the patient in this case is dubia ad malam. Furthermore, this patient should undergo a comprehensive examination such as cholesterol, hepatitis and autoimmune examination to see if there are other causes of the disease experienced by the patient.

CONCLUSION

The case study involved a 55-year-old male patient with hepatic cirrhosis caused by diabetes mellitus. The patient had uncontrolled diabetes that was only diagnosed in the past nine months, even though the symptoms had already appeared eight years ago. This uncontrolled diabetes then leads to complications in the liver, promoting the development of hepatic cirrhosis in such patients. This study provides a deeper understanding of the diagnosis, risk factors, disease course, and treatment of cirrhosis hepatis due to diabetes mellitus. From here, further research can be carried out to develop a more thorough diagnosis method and also to increase the confidence of clinicians in diagnosing the cause of cirrhosis.

REFERENCES

Asdie, R. H., Witjaksono, D. P., & Loehoeri, S. (2017). Buku Ajar Ilmu Penyakit Dalam. *Interna Publishing*.

Cheemerla, S., & Balakrishnan, M. (2021). Global Epidemiology of Chronic Liver Disease. *Clinical Liver Disease*. https://doi.org/10.1002/CLD.1061

Coman, L. I., Coman, O. A., Bădărău, I. A., Păunescu, H., & Ciocîrlan, M. (2021). Association between Liver Cirrhosis and Diabetes Mellitus: A Review on Hepatic Outcomes. *Journal of Clinical Medicine 2021,*. https://doi.org/10.3390/JCM10020262

Elkrief, L., Rautou, P. E., Sarin, S., Valla, D., Paradis, V., & Moreau, R. (2016). Diabetes mellitus in patients with cirrhosis: clinical implications and management. *Liver International*. https://doi.org/10.1111/LIV.13115/SUPPINFO

Garcia-Compean, D., Jacquez-Quintana, J. O., Gonzalez-Gonzalez, J. A., & Maldonado-Garza, H. (2009). Liver cirrhosis and diabetes: Risk factors, pathophysiology, clinical implications and management. *World Journal of Gastroenterology*. https://doi.org/10.3748/wjg.15.280

Huang, D. Q., Terrault, N. A., Tacke, F., Gluud, L. L., Arrese, M., Bugianesi, E., & Loomba, R. (2023). Global epidemiology of cirrhosis — aetiology, trends and predictions. *Nature Reviews Gastroenterology & Hepatology 2023*. https://doi.org/10.1038/s41575-023-00759-2

Jameson, Fauci, Kasper, Hauser, Longo, L. (2019). *Harrison's Principles of Internal Medicine*. Mc Graw Hill Education.

Kementerian Kesehatan RI. (2022). Direktorat Pencegahan dan Pengendalian Penyakit Menular Kementerian Kesehatan. *The Acceptance of Islamic Hotel Concept in Malaysia: A Conceptual Paper*.

Li, X., Jiao, Y., Xing, Y., & Gao, P. (2019). Diabetes Mellitus and Risk of Hepatic Fibrosis/Cirrhosis. *BioMed Research International*. https://doi.org/10.1155/2019/5308308

PERKENI. (2019). Pedoman Pengelolaan dan Pencegahaan DM Tipe 2 Dewasa Indonesia. *Perkumpulan Endokrinologi Indonesia*, 113.

Ramachandran, T. M., Rajneesh, A. H. R., Zacharia, G. S., & Adarsh, R. P. (2017). Cirrhosis of Liver and Diabetes Mellitus: The Diabolic Duo? *Journal of Clinical and Diagnostic Research : JCDR*. https://doi.org/10.7860/JCDR/2017/30705.10529

Rao, P. N. (2014). Nodule in Liver: Investigations, Differential Diagnosis and Follow-up. *Journal of Clinical and Experimental Hepatology*. https://doi.org/10.1016/J.JCEH.2014.06.010

Schuppan, D., & Afdhal, N. H. (2008). Liver Cirrhosis. *Lancet*. https://doi.org/10.1016/S0140-6736(08)60383-9

Sharma, B., & John, S. (2022). Hepatic Cirrhosis. *Medicine (Spain)*. https://doi.org/10.1016/j.med.2020.04.001

Suva, M. (2014). A Brief Review on Liver Cirrhosis: Epidemiology, Etiology, Pathophysiology, Symptoms, Diagnosis and Its Management. *Molecular Pharmacology*.