

A CASE OF HEPATOCELLULAR CARCINOMA WITH INITIAL PRESENTATION OF NON-ISLET CELL TUMOR HYPOGLYCEMIA

I Kadek Dwi Iman Muliawan¹, Kadek Dwi Pramana², Gusti Agung Wilaja Putra³

¹General practitioner, Lombok Utara General Hospital, North Lombok,
²Indonesia Internist, Lombok Utara General Hospital, North Lombok, Indonesia
³Internist, Mataram General Hospital, Mataram, Indonesia

Corresponding author: 1* I kadek Dwi Iman Muliawan. Lombok Utara General Hospital, North Lombok,
Indonesia.

Email : ikadek.dwi.iman@gmail.com

Abstract

NICTH (*Non-Islet Cell Tumor Hypoglycemia*) is hypoglycemia caused by extrapancreatic tumors. A 29 year old man presented with decreased consciousness, often felt weak, trembling and sometimes had stomach pains at home. In the last month the patient has experienced hunger and thirst easily. Blood glucose at arrival was 5 mg/dl, C Peptide level 0.04 ng/ml, Triglycerides 221 mg/dl and Ct results Abdomen Multifocal hepatoma in the left lobe. Despite repeated episodes of hypoglycemia during the eight days of treatment, blood glucose levels began to stabilize after receiving glucocorticoids. Because tumor-induced hypoglycemia is uncommon, the diagnosis of NICTH is frequently missed. To confirm the diagnosis of NICTH, additional tests such as IGF II, IGF I, insulin, proinsulin, and beta hydroxybutyrate are needed. Increased production of Insulin Growth Factor II (IGF-II) by tumor cells can be used to diagnose hypoglycemia caused by non-islet cell tumors.

Keywords: NICTH, IGF II, Hypoglycemia, Hepatocellular Carcinoma

Introduction

ICTH (Non-Islet Cell Tumor Hypoglycemia) is rare. NICTH is defined as a hypoglycemia event caused by an extrapancreatic tumor. NICTH can occur in mesenchymal tumors, hepatocellular carcinoma and other extrapancreatic tumors. Pathogenetically, NICTH occurs due to increased production of IGF II (*Insulin Growth Factor II*) by tumor cells and becomes a precursor that activates insulin receptors resulting in increased use of glucose by the tissue.⁵ As a result, patients may experience neurogenic complaints, neuroglycopenic symptoms or a combination of both.³

A 29 year old man was brought to the emergency room with decreased consciousness some time before entering the hospital. Initially the patient experienced a decrease in appetite from 1 day ago. The family said that the patient often felt weak, trembling and sometimes had stomach aches at home. In the last month the patient has experienced hunger and thirst easily. The patient's family denies that there is a history of hypertension, diabetes mellitus, a history of long-term drug consumption, a history of jaundice and a history of drinking alcohol. Physical examination revealed a general condition. Weakness GCS E2V2M5. Abdominal examination. Normal bowel sounds. Pressing pain in the right hypochondrium. Palpable liver 3 fingers below the arch. costa. There was no abdominal distension or splenomegaly.

Table I. Laboratory Examination Results

Laboratory examination	Result
1. Routine blood	Within normal limits
2. Current Blood Sugar	5 mg/dl
3. Liver function	
SGOT	54 U/L
SGPT	60 U/L
4. Kidney Function	
Ureum	16 mg/dl
Creatine	0.14 mg/dl
5. Electrolyte	
K	2.62 mmol/L
Na	145.2 mmol/L
Cl	108.6 mmol/L
iCa	1,137 mmol/L
6. Serology	
HCV	Negative
HBsAg	Negative
7. Thyroid Function	
FT4	1.15 ng/dl
TSHs	2,114 ng/dl
8. C Peptide	0.04 ng/mL
9. Lipid Profile	
Total Cholesterol	167 mg/dl
Triglycerides	221 mg/dl
LDL	87 mg/dl
HDL	36 mg/dl

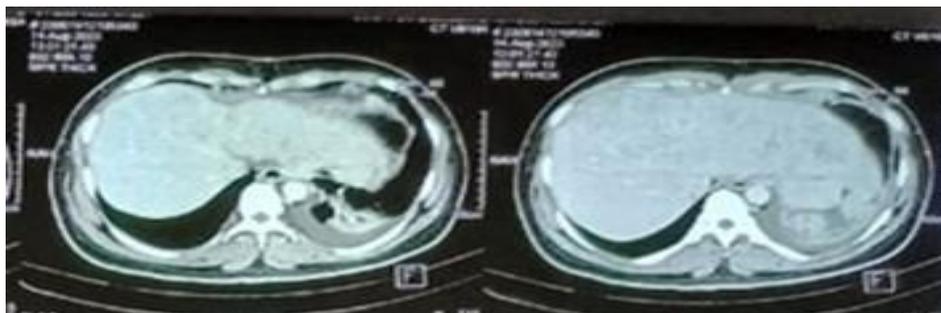


Fig. 1 Abdominal CT Scan Results

Table II. Therapy During Treatment

Therapy During Treatment		
IGD therapy	Treatment Days 1 – 6	Treatment Day 7-8
<ul style="list-style-type: none"> Line 1: Bolus D40% 3 Flacons followed by maintenance D10% 500 cc/8 hours Line 2: Drip Kcl 50 meq in NS 500 cc 20 tpm Inj. Omperazole 40 mg/24 hours iv Check GDS periodically every 30 minutes 	<ul style="list-style-type: none"> If GD <70 mg/dl bolus D40% and continue maintenance D10% 500 cc/8 hours Inj Pantoprazole 40 mg/24 hours iv Check GDS periodically 	<ul style="list-style-type: none"> If GD <70 mg/dl bolus D40% and continue maintenance D10% 500 cc/8 hours Inj Pantoprazole 40 mg/24 hours iv Check the GDS periodically Hydrocortisone 100 mg/24 hours IV

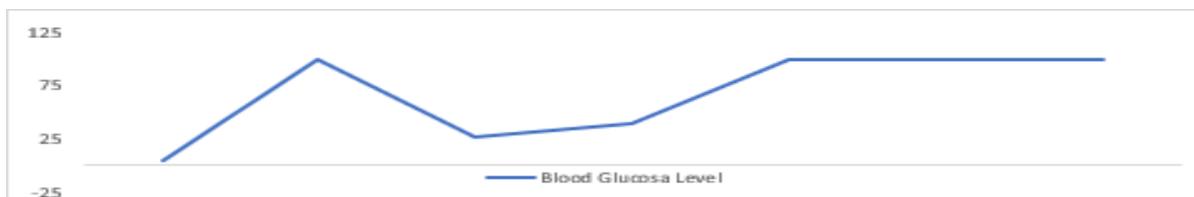


Fig 2. Blood Glucose Check Results During Treatment

Discussion

Hypoglycemia is an emergency condition and is always associated with complications of insulin and the use of insulin drugs. The incidence of hypoglycemia related to Non-islet Cell Tumor hypoglycemia (NICTH) is rare and often leads to underdiagnosis by health workers. The occurrence of hypoglycemia is related to increased production of Insulin Growth Factor II (IGF-II) by tumor cells and becomes a precursor that activates the insulin receptor.⁵ Suspicion of NICTH in the patient began with the CT results of the abdomen which showed hepatoma and a decreased C Peptide examination. Pathogenetically, to diagnose NICTH additional tests are needed such as

IGF-1, IGF-II, insulin levels, proinsulin and beta hydroxybutyrate.⁴ Where there was an increase in the IGF-II/IGF-I ratio and a decrease in insulin, C peptide, Pro insulin and beta hydroxybutyrate levels. During 8 days of treatment, the patient experienced repeated hypoglycemia conditions. However, after receiving glucocorticoids, blood glucose was more stable.

Conclusions

The incidence of hypoglycemia due to NICTH is mostly underdiagnosed. Decreased consciousness is the most common symptom in patients with hypoglycemia due to tumors, although the symptoms are related to the stage of cancer, but hypoglycemia due to tumors can also be considered the cause. Therefore, a comprehensive history, physical examination and examination are needed to diagnose NICTH.

Acknowledgements

The author is pleased with all the nurses and supervisors of the North Lombok Hospital and Mataram City Hospital who have given them the opportunity to take the case

References

1. Asahiro Kitada, Shunsuke Yasuda, Nana Takahashi, Satoshi Okazaki, Kei Ishibashi , Satoshi Hayashi, Yoshinobu Ohsaki, Naoyuki Miyokawa. Non-islet cell tumor hypoglycemia caused by intrathoracic solitary fibrous tumor: a case report. *Journal Of Cardiothoracic Surgery* 2016. DOI 10.1186/s13019-016-0463-6
2. Pik Eu Chang, Wai Choung Ong, Hock Foong Lui, Chee Kiat Tan. *Epidemiology and Prognosis of Paraneoplastic Syndromes in Hepatocellular Carcinoma: Clinical Study*, Hindawi Publishing Corporation ISRN Oncology 2013, Volume 2013, Article ID 684026, 8 pages
3. Pinaki Dutta , Anuradha Aggarwal, Yashpal Gogate, Uma Nahar, Viral N Shah, Mandeep Singla, N Khandelwal, Anil Bhansali. Non-islet cell tumor-induced hypoglycemia: a report of five cases and brief review of the literature. *Endocrinology Diabetes And Metabolism* 2013. DOI 10.15300/EDM-13-0046
4. Timoti W. Bodnar, Maria J Acevedo and Massimo Pietropaolo. Management of Non Islet Cell Tumor Hypoglycemia: A Clinical Review. *Journal Of clinical Endocrinology and Metabolism* 2013. DOI 10.1210/jc.2013-3382
5. Vishnu Garla, Hardik Sonani, Venkatraman Palabindala, Celso Gomez-Sanchez, Non Islet Cell Hypoglycemia: Case Series and Review Of The Literature. *Frontiers in Endocrinology* 2015. DOI 10.3389/fonc.2015.11885779