Article published online: 2021-05-23

Malignant Hypertension Secondary to Renin-Producing Hepatoblastoma

Abstract

Clinical presentation of hepatoblastoma is often insidious and its paraneoplastic manifestations are not uncommon. We report an extremely rare case of a renin-secreting hepatoblastoma inducing malignant hypertension remarked in our clinic. The hepatic malignancy classified as PRETEXT IV and a multidisciplinary approach according to SIOPEL III was made with a poor outcome. Hepatoblastoma in children should be considered as possible etiology of hypertension in children.

Keywords: *Hepatoblastoma, hypertension, paraneoplastic*

Doinita Sfrijan[1], Cristian Scurtu[1], Mihaela Paca[1], Dan-Alexandru Iozsa[2]

[1]Department of Oncology, Pediatrics Clinic, "Marie Sklodowska Curie" Emergency Clinical Hospital for Children, [2]Pediatric Surgery Clinic, "Marie Sklodowska Curie" Emergency Clinical Hospital for Children, Bucharest, Romania

Introduction

Hepatoblastoma accounts for 1% of pediatric cancers with an incidence peak in the first 5 years of life and a slight male preponderance.[1,2] Clinical presentation may include from rapidly enlarging abdominal mass to abdominal pain, abdominal pain, failure to thrive in young children, or loss of weight in adolescents. Paraneoplastic manifestations are commonly described.[3] Extremely rare, a hepatoblastoma, can be the cause of severe high blood pressure in children, and to the best of our knowledge, this is the fifth report in the literature.[4-7]

Case Report

An ultrasound performed in a secondary unit for unspecific abdominal chronic abdominal pain in a 12 years old boy revealed a large hepatic mass involving most of the left lobe. Computed tomography (CT) scan completed the picture emphasizing satellite distant liver nodules in segments IV, V, VI, and VIII, left portal vein thrombosis and bilateral lung metastases. Initial alpha-fetoprotein (AFP) level was 21,290 ng/mL. Seven days later, the patient manifests severe paroxysmal arterial hypertension, tonic–clonic seizures and he is referred to our hospital for intensive care.

At admission, the patient presented drowsiness, headaches, blurry vision, and abdominal distension. The blood pressure was 180/120 mmHg, and the heart rate 120 bpm. His body mass index related to age was at percentile 98. Blood workup showed a sodium level of 1292 mmol/L, potassium level of 3,38 mmol/L and neutrophilic leukocytosis. Urine sample completed the electrolyte imbalance picture with a sodium of 10.12 mmol/L and potassium of 27.9 mmol/L. AFP level was 39986 ng/mL level. CT scan of the head has been performed, and no abnormalities were found. Echocardiography has been done revealing left ventricular hypertrophy.

The seizures were inconstantly controlled using phenytoin and levetiracetam, and the paroxysms of severe hypertension variably responded to amlodipine, metoprolol, and enalapril therapy so an open liver biopsy could be performed safely. The histopathologic and immunohistochemical studies concluded to mixed embryonal/fetal hepatoblastoma, macrotrabecular pattern, high mitotic rate, and 50% Ki-67 labeling index. The diagnosis of unresectable, high-risk PRETEXT IV mixed embryonal hepatoblastoma was concluded. Considering the refractory paroxysms of high blood pressure associating the solid malignancy, plasma renin activity was measured finding out high levels of 1437 mIU/mL.

The chemotherapy was initiated according to SIOPEL 2001 guidelines for high-risk hepatoblastoma. The patient responded initially very well to the adjuvant therapy: tumor size regression and dynamic decreasing of AFP levels. No more seizures and normal blood pressures were noted.

How to cite this article: Sfrijan D, Scurtu C, Paca M, Iozsa DA. Malignant hypertension secondary to renin-producing hepatoblastoma. Indian J Med Paediatr Oncol 2020;41:273-4.

Submitted: 17-Jul-2018
Accepted in Revised Form: 18-Oct-2018
Published: 13-Jun-2020

Address for correspondence:
Dr. Dan-Alexandru Iozsa, Emergency Clinical Hospital for Children "Marie Sklodowska Curie", 20 Brancoveanu C-tin Blvd., Bucharest, Romania.
E-mail: dan.iozsa@yahoo.com

Access this article online

Website: www.ijmpo.org

DOI: 10.4103/ijmpo.ijmpo_159_18

Quick Response Code:

The plasma renin activity after 2 cycles of chemotherapy decreased to 181 mIU/mL. The tumor reduction was insufficient remaining unresectable, the liver transplant could not have been done in time and chemotherapy had to be interrupted due to severe thrombocytopenia. The patient died 6 months later due to hepatic failure.

Discussion

Paraneoplastic presentation of hepatoblastoma is common, most often represented by thrombocytosis, erythrocytosis or hypocalcemia. Isosexual precocious puberty or hypoglycemia have also been reported.[3]

Symptomatic, severe high blood pressure is rare in children, and most of the times, it hides an underlying cause, usually a renal disease. Hypertension as paraneoplastic phenomenon in childhood malignancies has also been in reported in pheochromocytomas or neuroblastomas– where catecholamine secretion is the main pathogenetic pathway.[8] Hypersecretion of the renin by the tumor cells as the cause leading to high blood pressure is usually present in benign juxtaglomerular tumors; however, neoplasms Grawitz's or Wilms'or Grawitz's or Wilms' tumor have also been reported.[4,8]

Because of the lack of access to facilities such as immunohistochemical study or polyclonal antibody for human renin activity, we could not prove the secretion of renin just by tumor tissue cells, but this is very likely since our patient's blood pressure has subsequently decreased as a side response to chemotherapy with no further antihypertensive or antiseizure treatment required.

A comprehensive research of the literature outlines 4 previous cases of severe hypertension increased plasma renin activity in hepatoblastoma. Our case presents the eldest patient of the series so far. Unfortunately, the high-risk features and the contraindication of surgery endorsed the worst prognosis of the neoplasm.

Hepatoblastoma coexisting with hypertension should be considered and checked as a possible etiology for the high blood pressure.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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