



Case Study: Importance of Timely Diagnosis of Non-Alcoholic Fatty Liver Disease in a Child with Vague Symptoms: Part 1

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Abstract

Introduction: This article describes complications of misdiagnosed Non-Alcoholic Fatty Liver Disease in an 8-year-old overweight child presented to Emergency Room due to vomiting and severe epigastric pain. The child complained of headache, shortness of breath during physical activities, tiredness, pressure on heart, and increased waist circumference for few months before visiting hospital.

Materials and Methods: Initial assessments were completed by an Emergency Room physician, a family physician, and a hepatologist in early 2016. Further assessments will be reported in follow-up articles.

Results: The child who was misdiagnosed for indigestion or gastritis, due to family history of positive H-pylori in his father, was found to have extremely high level of Liver Function Tests, hepatomegaly, dyslipidemia, constipation, bloating, and a diet full of junk food. Based on the initial assessments and referral to hepatologist, NAFLD is reported as the initial diagnosis.

Conclusion: Considering increasing prevalence of NAFLD in children, routine screening of overweight and obese children for possibility of NAFLD is recommended so early interventions and lifestyle changes can be implemented. Quality of life is affected a child with a large liver due to its pressure on adjacent organs.

Keywords: Non-alcoholic fatty liver disease; Dyslipidemia; Obesity; Children; High liver functions; Hepatomegaly

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Introduction

Hepatomegaly due to the Non-Alcoholic Fatty Liver Disease is prevalent in children of industrial countries where children obesity is a public health issue as well as a primary care concern [1]. Timely diagnosis of NAFLD in a child with vague symptoms could lead to prevention of severe complications and chronic medical illnesses that are devastating in childhood and create unnecessary expenditure for healthcare systems as they could cause chronic illnesses in adulthood [2]. The concept of nourishment has been replaced by eating too much and not having a healthy variety of foods suggested by the Nutrition Guides [3].

The Fatty Liver Disease can start as early as age four [4]. In fact, the childhood obesity rate has increased in the past few decades and the timely diagnosis and correction of diet and lifestyle can save lives, prevent chronic diseases, and save the healthcare budget [5,6]. The presence of hepatomegaly due to Fatty Liver Disease should be considered a dire diagnosis that needs extreme attention and continuous follow-up until the child is healthy again because the percentage of adolescents diagnosed with the disease is increasing [7,8].

The NAFLD is asymptomatic until another medical condition accidentally reveals its presence or leads to other consequences that are seen in this child who presented to the ER due to vomiting and epigastric pain. The focus of this case report is on timely diagnosis and paying attention to the possibility of misdiagnosis or late diagnosis of NAFLD. If healthcare care providers consider NAFLD diagnosis in every cute, chubby, and possibly overweight child, early interventions can change the course of treatment tremendously [9,10].

Case Presentation

The 8-year old overweight child presented to the emergency department with epigastric pain,

Table 1: First set of lab tests in the emergency room.

Lab test	Result	Range	Status
Total Bilirubin	5	<5 Umol/L	
Direct Bilirubin	1	0-1 Umol/L	
ALT	297	<32 U/L	Abnormal (almost 10 times higher)
ALK PHOS	249	142-336 U/L	
AST	108	<37 U/L	Abnormal (almost 3 times higher)
GAMMA GT	60	15-80 U/L	
CBC is normal except RBC	5.18	4.5-5.15 X10 ¹² /L	Abnormal (slightly high)

Table 2: Second set of lab tests by family physician at a different laboratory.

Blood tests	Results	Normal range	Unit	Status
Glucose Fasting	5.0	2.8-6.1	Mmol/L	
ALT	204	4-43	U/L	Abnormal
ALK PHOS	222	133-340	U/L	
Bilirubin Total	7	3-18	UMOL/L	
AST	78	6-42	U/L	Abnormal
GAMMA GT	49	5-50	U/L	
H. Pylori IGG Antibody	<0.40	<0.90	U/ml	
Fasting Cholesterol	5.36	<4.60	Mmol/l	Abnormal
LDL cholesterol	3.55	Clinical target <2.0 or 50% decrease in LDL-c	Mmol/L	Abnormal
HDL Cholesterol	1.36	>1.29	Mmol/L	
Chol /HDL Ratio	3.94			Abnormal
Non HDL cholesterol	4.00	<2.6	Mmol/L	Abnormal

vomiting and some strikes of blood in vomitus, which frightened the family the most. He was assessed in the emergency department and was kept under observation for few hours to rule out acute abdomen. An X-ray of abdomen and a set of essential blood tests were ordered.

Past medical history

The family reported that the epigastric pain was repeated frequently in the past few months but was interpreted for bloating and extra gas in bowels and the urgent need for defecation. Each time after defecation, the pain was lessened and the family assumed that the pain was due to constipation. In addition, the family specified that the child's stool floated on the toilet water in the past few weeks. The defecation had become extremely strenuous and the child had a very large abdomen with extra bowel gas in his digestive system shown as consistent passing of gas.

The child's abdominal circumference began increasing in the year previous to the Emergency Room visit and all the pants for his age were too tight for him so size 18 pants (instead of size 8-10) were purchased for this 8-year-old child. In the past few days before arriving in the Emergency Room, severe epigastric pain and vomiting were reported in the early morning but it was interpreted as extra stomach acid. The child was complaining of heartache and showed the left side of his chest as the pain was occurring. Very puzzling for the family, the child complained of headaches, especially at night, extreme sweating at night, tiredness, dry itchy skin, pain in the legs, feeling of pressure on the heart, and shortness of breath. The child became angry very often as he was being more sensitive than previous months. He was also upset that his abdominal circumference had increased tremendously and complained about it.

Family history

The family history of Gastroesophageal Reflux and Helicobacter

Pylori in his father led to initial differential diagnosis of possible gastritis due to excessive acid secretion. The family history showed Diabetes in both paternal grandparents and in the child's father. The father was also diagnosed with Non-Alcoholic Fatty Liver Disease, received medication to lower lipids and glucose, and was advised to reduce weight.

Results

At the time of arrival at the hospital, weight was 45 Kg and height 136 cm. Please note that Canadian Diabetes Foundation emphasizes that the children and elderly have a lower muscle mass so the lower level of Body Mass Index of 24.3 in the 8-year-old child would be considered obesity rather than normal range shown in adults [11,12].

Diet and lifestyle

The diet of the child was assessed and was full of junk food and no vegetable or fruit [3]. The child was inactive due to playing digital video-games. Child left the swimming class due to shortness of breath after the speed and endurance of swimming lessons increased.

Abdominal x-ray

The plain x-ray showed residues of stool in large bowel in different locations despite routine daily defecation. No other abnormality was reported.

Ultrasound

The ultrasound reported hepatomegaly filled with fat measured 17 cm horizontally and no other abnormalities [13].

Blood work-up

The initial set of blood tests revealed extremely high level of Liver Function Tests (AST and ALT), which were about 10 times higher

than the normal level [14-17]. The first set of laboratory tests are summarized in Table 1.

After ER visit, the child was followed up in the office and the Family Physician requested Abdominal Ultrasound and complete blood and urine lab tests including the test for *Helicobacter Pylori*. The child was scheduled to visit Family Physician to check the weight and general conditions every month after hospital visit for 6 months [18-21]. Table 2 shows the additional tests results. The Complete Blood Count (CBC) and Urine Analysis were reported as normal. As Table 2 shows the level of both AST and ALT has decreased comparing to Table 1. The level of cholesterol was very high too. After a period of 2 months of healthy diet and complete defecation of bowels, weight started decreasing [10]. Therefore, the modifications in diet and exercise showed positive results in this child immediately after intervention, which is promising [22].

Referral to the hepatologist

American Association of Family Practise has provided guidelines for assessment of Fatty Liver Disease [15,23]. Further referral to the Hepatologist located at a Gastroenterology and Liver clinic of a children specialty hospital led to further tests Ruling out other reasons led to initial diagnosis of Non-Alcoholic Fatty Liver Disease at this time. Thyroid function was reported as normal [24,25]. Further assessment will be performed and the results will be reported in follow-up articles.

Discussion

The statistics show that 73% of overweight people develop simple fatty liver and 23% of them develop inflamed fatty liver [7]. The holiday tradition of extra sweets and treats became every day diet of an 8-year-old child. The patient reported caused an extremely dangerous high level of Liver Function Tests, dyslipidemia, 17 cm hepatomegaly, increased abdominal circumference, headache, extra sweating, epigastric pain, leg pain, itchiness, tiredness, and an irritable mood. If this medical condition had been left untreated or undiagnosed, it might have led to cirrhosis and loss of liver tissue [16].

In this child, the rise of AST was almost 10 times more than the normal limit (Table 1). A stool softener was prescribed for the child for 10 days to remove all the residues of stool in the bowel due to the size of the liver. This size of the liver explained the pressure on the heart (heartache), incomplete defecation and remained stool in large bowel, pain in epigastric area due to pressure of liver on stomach, and shortness of breath due to pressure on lungs [13]. Quality of life of children with NAFLD is affected by the size of liver and its pressure on the adjacent organs [26]. Besides, the ability of children to perform physical activity is less than normal [27]. Comparison of tests showed decreasing level of Liver Function Tests, which is promising and show the positive effects of early intervention and change in lifestyle and diet [10].

Timely Diagnosis of Non-alcoholic Fatty Liver Disease in a child with vague symptoms can save lives. If physicians consider the possibility of NAFLD in overweight children and include the routine screening for hepatomegaly, Liver Function Tests, and Dyslipidemia especially in families with high risk factors such as diabetes, the cost of prevention and early intervention is less than cost of more advanced assessments and treatment options for undiagnosed or misdiagnosed cases of hepatomegaly due to NAFLD. Families should receive information pamphlets from schools, community centers, healthcare professionals regarding NAFLD.

Conclusion

After a few months of avoiding sweet, fatty, and junk food in a child who was initially diagnosed with Non-Alcoholic Fatty Liver Disease, this child is now putting on size 14 pants, have no abdominal pain or heartache, headache, or extra sensitivity. His family has chosen a liver-friendly diet full of green vegetables and healthy fruits and has cut down on the amount of consumed fat and sugar. He is now able and willing to participate in sport activities in school, community centers, and started his swimming lessons and competitive swimming. He shows more positive attitude toward friends and family members, and laughs more often. The repeated tests (Table 2) show improvement just by changing lifestyle and diet of an 8-year-old. Further follow-up tests and additional assessment will be reported in future articles and will provide a better long-term picture of changes in liver function tests.

This case report emphasizes the possibility of presence of extremely large size liver in children who complain of headache, abdominal pain, and extreme tiredness. It is crucial to remember the hepatomegaly and possibility of Non-Alcoholic Fatty Liver Disease (NAFLD) in children as well. Considering an early abdominal ultrasound plus the complete laboratory tests including Lipid Profile, Liver Function Tests, Blood Glucose, Urinalysis can save lives. Children' obesity and NAFLD should be treated as public health issues that lead to many chronic diseases during childhood and adulthood. A simple clinical picture of indigestion, bloating, and epigastric pain in overweight or obese children could be NAFLD with hepatomegaly, which significantly decreases quality of life and could lead to chronic illnesses in adulthood if left untreated. Additionally, referrals to dietitian, correction of lifestyle, and follow-up visits are recommended.

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