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CASE REPORT

A Case of Fulminant Hepatitis Induced by Measles in an 8-Month-Old Female

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ABSTRACT

Background: Measles is a common viral infection in children that is self-limiting, but the fulminant hepatitis induced by measles is a very rare case. We present the case of fulminant hepatitis induced by measles in an 8-month-old female.

Case presentation: An 8-month-old female, known case of protein-calorie malnutrition with a clinical diagnosis of measles. Later on, she developed complications for which multiple labs were performed, confirming the diagnosis of fulminant hepatitis induced by measles.

Conclusion: A child exhibiting irritability, nausea, and rapid onset of bruising should undergo a comprehensive panel of investigations for timely diagnosis and management.

Keywords: Fulminant Hepatitis, Measles, Protein-Calorie Malnutrition

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Introduction

According to updated statistics, over 100,000 deaths are reported because of measles, which is why it is still considered a major public health issue (1). Measles is a highly infectious disease that is caused by a virus named Rubeola. It is a preventable illness with vaccination on time. Its major infestation is fever and rash (2). Annually, 350,000 cases were reported in 2018, and despite the availability of vaccines, the death toll was reported as 142,300, with the majority of the population below 5 years, as compared to 017, in which only 110,000 deaths were reported (3). It is an airborne virus, which is why it is a highly transmissible disease. It is one of the major public health issues in third-world countries. Because of this, it is also having a bad impact on the economies of countries, as in 2018, about 200,000 US dollars were spent on 2614 cases in Uganda (4).

Acute liver failure, fulminant hepatic failure, or FHF is a rare clinical case in which the deterioration of liver function occurs very rapidly; it can be because of pre-existing pathology or without any previous existing pathology (5). In children, it is very difficult to diagnose based on their clinical signs, which is why the signs are not part of the diagnostic criteria. Around 50% to 70% of mortality is associated with hepatic encephalopathy (6, 7).

The main aim of this case report is to enhance the literature on the fulfillment of hepatitis induced by measles,

Case Report

An 8-month-old girl weighing 5 kg presented to the outpatient department at Naseer Teaching Hospital, Peshawar, on July 24, 2024. Her chief complaints included fever for 8 days, vomiting for 4 days, and a cough for 4 days. According to her mother, the fever began 8 days prior and was undocumented at first. In the following days, the fever became continuous and was associated with a rash that started behind the ears, along with a decreased appetite. The girl had a known case of protein-calorie malnutrition (PCM). She began experiencing non-projectile vomiting after breastfeeding and also reported a cough. The family confirmed a history of contact with someone who had measles. The fever responded to paracetamol, and her vaccinations were up to date. After being admitted to the measles ward, a complete blood count (CBC), chest X-ray, C-reactive protein (CRP), serum electrolytes, and urea tests were ordered. The CBC revealed low hemoglobin and hematocrit levels, while the rest of the values were within normal limits. The chest X-ray showed infiltrates (as seen in Figure 1). The CRP level was 27.96 mg, and the serum electrolytes and urea were normal. The girl was diagnosed with measles complicated by pneumonia. Following established guidelines, she received symptomatic treatment along with appropriate nutritional support due to her underlying PCM.

On July 25th, treatment with PCM serum albumin was recommended, as the serum albumin level was 3.6 g/dL. Around 2 PM, the patient's oxygen saturation suddenly dropped to 75%, accompanied by nasal flaring, chest in-drawing, and vomiting. At that time, a nasogastric (NG) tube was inserted to prevent aspiration. Blood tests for CK-MB and high-sensitivity troponin were sent to the lab; the results showed CK-MB at 47 U/L, while the high-sensitivity troponin levels were normal.

On July 26th, the patient developed seizures, exhibited irritable movements, showed bruising, and experienced abdominal swelling. Emergency management was initiated for resuscitation. An abdominal ultrasound was performed, which revealed minimal ascites, gallbladder edema, and hepatomegaly. Liver function tests (LFTs) were ordered by the radiologist, showing an ALT level of 1582 U/L. At that point, the patient was suspected of having fulminant hepatitis. Subsequent laboratory results indicated elevated levels of both direct and indirect bilirubin, while a random blood sugar measurement showed 40 mg/dL. The serum electrolytes revealed hyponatremia and hyperkalemia. Virology tests returned negative results, and an abnormal finding was noted in the coagulation profile, with prothrombin time (PT) being abnormal.

Symptomatic treatment was initiated, including 100 mL of fresh frozen plasma administered once daily, 0.5 mg of intravenous furosemide (Lasix) as a stat dose, and 20 mL of intravenous pentaglobin as a stat infusion.

By July 27th, fresh laboratory tests indicated an ALT level of 3000 U/L, serum alkaline phosphatase at 428 U/L, activated partial thromboplastin time (APTT) at 60 seconds, PT at 45 seconds, serum albumin at 2.7 g/dL, and hemoglobin at 8.6 g/dL. The serum electrolytes and urea levels were normal. The treatment plan continued, and discussions were held regarding the patient's progression.

On July 28th, the patient showed signs of improvement, with lab results revealing an ALT level of 2790 U/L, serum alkaline phosphatase at 505 U/L, APTT at 46 seconds,

PT at 29 seconds, and hemoglobin at 8.9 g/dL. Additionally, liver size had regressed by 2 cm. The nasogastric (NG) tube was removed, and the patient was allowed to start oral intake.

By August 1st, the patient remained on the same treatment regimen and was closely monitored. Lab results on this date showed hemoglobin at 9.3 g/dL, serum alkaline phosphatase at 558 U/L, APTT at 30 seconds, PT at 15 seconds, and serum albumin at 3.8 g/dL.

Figure 1: showing pneumonia patches.

On August 2nd, discharge was planned. Before her release, we conducted lab tests, and her serum albumin and clotting factors showed improvement. We discharged her with a multivitamin prescription and a detailed nutritional chart. During her follow-up appointment on August 10th, her lab results were normal.

Written consent was taken from the patient's guardian for the case report.

Discussion

Compared to adults, measles-induced fulminant hepatitis is very rare in children (8). Historically, about 71% to 89% of hepatitis cases were attributed to measles (9,10). Fulminant hepatitis is diagnosed based on a triad of symptoms: altered coagulation, disturbances in mental status, and jaundice. However, in children, jaundice may not be present due to the acute nature of the disease(11).In Greece, during the peak of the measles epidemic, a study involved 189 children with measles-induced hepatitis. Of these, only 9 children showed elevated liver enzymes but exhibited no symptoms of liver failure(12). For a diagnosis of liver failure to be made, clinical symptoms must be present; otherwise, it cannot be classified as fulminant hepatitis. Another study conducted during 2017-2018 reported elevated transaminase levels as the most common finding in children with measles, yet these cases had no clinical symptoms of liver failure. Only 9 children exhibited symptoms of liver failure. Among these, 2 had underlying health conditions, and only 3 required intensive care; one of these cases resulted in death (13). Additionally, a case from 1992 discussed a rare instance of measles-induced acute liver failure (14). In 2017, another case of acute liver failure induced by measles was reported, which required a liver transplant (15).

Our diagnosis of fulminant hepatitis induced by measles was confirmed through clinical examination and laboratory investigations. The signs and symptoms associated with fulminant hepatitis, including tremors, vomiting, abdominal swelling, palpable liver, high irritability, low oxygen saturation (SpO2), and bruising, were also helpful in establishing the diagnosis. At the time of diagnosis, we initiated supportive treatments

for the liver, including vitamin K, fresh frozen plasma (FFP), albumin, nutritional support, and management of fluid balance. Our patient responded very well to these treatments within just four days, which ultimately prevented the need for a liver transplant. This case report aims to raise awareness of measles-induced fulminant hepatitis within the medical community to improve patient care.

Conclusion

In conclusion, close monitoring of measles patients is essential to prevent complications. A child exhibiting irritability, nausea, and rapid onset of bruising should undergo a comprehensive panel of investigations for timely diagnosis and management. This prompt action can help avoid serious consequences, such as the need for a liver transplant, especially in third-world contexts.

Conflict of Interest: None
Funding Support: None

Ethical Permission

Patient confidentiality was maintained, and informed consent was taken from the patient guardian.

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All the authors agree to take responsibility for every facet of the work, making sure that any concerns about its integrity or veracity are thoroughly examined and addressed.