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Case Report **Pharmacy Practice**

Kwashiorkor in an 11-Month-Old Infant: A Case Report

Blessy Cherian[1], Aleesha Prakash[1], Aiswarya Wilson[2], Dr. Sr. Binu Jose[2]*, Dr. Rojo Joy[3]

[1]Pharm D Interns, Department of Pharmacy Practice, St. Joseph's College of Pharmacy, Cherthala, Kerala, India
[2]Associate Professor, Department of Pharmacy Practice, St. Joseph's College of Pharmacy, Cherthala, Kerala, India
[3]Consultant Neonatologist, Lourdes Hospital, Post Graduate Institute of Medical Science and Research, Ernakulam, Kerala, India

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***Corresponding author:** Dr. Sr. Binu Jose
Associate Professor, Department of Pharmacy Practice, St. Joseph's College of Pharmacy, Cherthala, Kerala, India

Abstract

Malnutrition is commonly observed in children in developing countries and is a major cause of multiple illnesses. Kwashiorkor in children is characterized by generalized edema and develops as a result of protein-calorie deficiency, whereas marasmus results from calorie and energy deficiency. We report a case of an 11-month-old female infant who presented with fever, cough, and excessive crying for 2 days. She was normal 2 days back, then developed high-grade fever, which is acute in onset, intermittent, relieved by medications, with multiple spikes with kwashiorkor features as idiopathic. The child also presented with hepatomegaly, hypoalbuminemia, hypoproteinemia, and elevated transaminases. Children with kwashiorkor typically have a very low plasma albumin concentration due to protein deficiency.

Keywords: Kwashiorkor, Protein Energy Malnutrition, Hypoalbuminemia, Hepatomegaly, Infant Nutrition.

INTRODUCTION

Undernutrition is caused by an insufficient intake of carbohydrates, fats, proteins, and micronutrients (vitamins and minerals). Marasmus, kwashiorkor, and mixed marasmic kwashiorkor are the major forms of severe energy and protein under nutrition [2]. Malnutrition is commonly observed in children in developing countries and is a major cause of multiple illnesses. Kwashiorkor in children is presented with generalized edema and develops as a result of protein-calorie deficiency, while marasmus results from calorie and energy deficiency [1]. Kwashiorkor is characterized by bilateral pitting oedema, commonly affecting the limbs and face, along with other distinctive signs such as discolored, brittle hair, an enlarged liver, and skin changes. Affected children often appear apathetic and have a poor appetite. Skin manifestations include hyperpigmented, cracked patches overlying hyperpigmented areas, with desquamation. In severe cases, the skin may ulcerate, leading to exudative, burn-like lesions that can result in fluid loss, increased risk of hypothermia, and secondary infections [3]. Severe acute malnutrition (SAM) amongst children aged 6–59 months exists in two clinical forms: non-edematous malnutrition (marasmus), defined by either weight-for-height z-score (WHZ) < −3 and/or a middle upper arm circumference (MUAC) < 115 mm, and edematous malnutrition (kwashiorkor), defined by bilateral pitting edema. Both can co-exist as marasmic kwashiorkor (edema plus WHZ score < −3). Whilst marasmic children are severely wasted with a skeletal appearance and often alert and hungry, kwashiorkor disease (KD) presents with edema of the limbs and face, discolored brittle hair, enlarged liver, skin lesions, and is often apathetic with a poor appetite [8].

CASE DESCRIPTION

An 11-month-old female baby came with complaints of fever, cough, and excessive crying for 2 days. She was normal 2 days back, then developed high-grade fever, which is acute in onset, intermittent, relieved by medications, and has multiple spikes per day. The child also had a cough, which was wet type, non-paroxysmal, non-spasmodic, and not associated with PTV. The child also has discoloration of hair for 2 months and increased weight gain. No history of breathlessness, lethargy, seizures, cyanosis, ear discharge, or cry during micturition. The infant was exclusively bottle-fed with ragi-based feeds.

Development was normal, and the child was immunized up to age. Based on the developmental assessment, neck holding was achieved at 3 months, Rollover at 7 to 8 months, sitting with support at 8 months, standing with support at 11 months, exhibited

babbling and monosyllabic sounds, Fine motor – immature pincer grasp noted.

Weight on admission was 7.1 kg. On examination, the child was conscious and febrile with a temperature of 101.3 F, pulse rate of 130 /min, and respiratory rate of 28/min. Pallor was noted. Heart sounds S1 and S2 were present. Air entry and breath sounds were bilaterally present. No focal neurological deficits were observed. An oral ulcer was present. The child was admitted and evaluated with necessary investigations. Protein-Creatinine ratio: 0.5:1, urine analysis normal.

Table I: Laboratory investigation

Lab Investigation	Normal Values	Reported Values
Total count	6000-14000 cells/mm	15800
Neutrophils	40-75 %	22
Hb	10-14g/dl	9.4
Lymphocytes	20-45%	66
CRP	0.8-11.2mg/L	24.1
SGOT	5-45u/L	356
SGPT	20-60U/L	153
Total protein	6.1-7.9g/dl	4.3
Albumin	3.4-4.2mg/dl	2.9
Calcium	8.8-10.8 mg/dl	8.1
Ammonia	11-35ug/dl	87.4

USG abdomen and pelvis (fig1) showed hepatomegaly (span 10.5cm) with increased echogenicity, normal span of spleen, and normal kidneys bilaterally. The child had a clinical picture of Kwashiorkor and iron deficiency anemia.

The child was managed with IV Cefuroxime for 3 days, Azithromycin for 5 days, IV vitamin K, nebulization, Multivitamins, adequate hydration, and other supportive medications. A diet chart and dietary advice were given. The child was clinically improved with treatment.

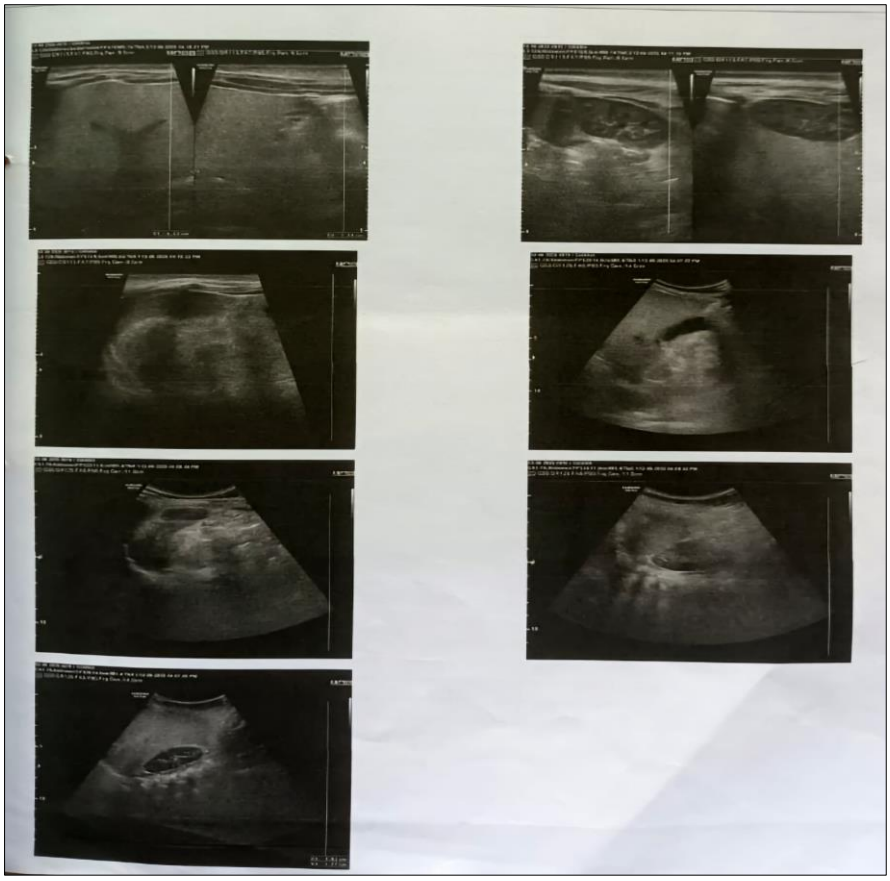

Fig. 1: USG abdomen of the 11-month-old infant at presentation

DISCUSSION

Kwashiorkor disease is a subtype of severe acute protein malnutrition characterized by peripheral edema associated with hypoalbuminemia and ascites. It can result from both protein deficiency and protein loss. In resource-poor countries, the disease is often caused by inadequate dietary intake, but in resource-rich countries, it can be seen as a rare complication of severe malabsorption [7].

In our case, the infant presented with hair discoloration, and a similar presentation has been shown in a case documented by Wolfe *et al*., in 2023, a case on cystic fibrosis with kwashiorkor in which the child was also presented with thin and reddish colored hair. The lab values in the study indicated elevated liver enzymes and hypoalbuminemia, which was also evident in the present case [5].

The child was presented with hepatomegaly confirmed on clinical examination and imaging. Similar hepatic involvement, particularly hepatic steatosis in complicated kwashiorkor, has been reported by Linneman *et al*., in 2025, in which Ultrasound imaging of the liver was notable for a liver parenchyma echogenicity greater than renal parenchyma echogenicity [6].

In a case report of Kwashiorkor in an infant by Kamaruzaman NA *et al*., revealed a normal full blood count, but low serum protein and albumin levels. Children with kwashiorkor usually have a very low plasma albumin concentration as a result of a lack of protein. However, new evidence has recently emerged that there are multifactorial causes behind edema in malnourished children, such as oxidative stress and intestinal microbiome changes [2]. The present case revealed laboratory findings of decreased protein and albumin levels.

Mori *et al*., describe a case of severe hypoalbuminemia provoked by an unnecessary and inappropriate elimination diet based on rice milk in an infant with severe atopic dermatitis (AD), which was thought to be secondary to food allergy. The child was also found to be anemic with a hemoglobin of 5.7 g/dl, and he received 4 g of albumin three times in 48 h, a red blood cell transfusion, oral iron, and folic acid. Vitamin K was also supplied because of a state of coagulopathy [activated partial thromboplastin: 31 s; prothrombin time 69 % (normal value: 80–100 %)]; fibrinogen 139 mg/dl; antithrombin III: 65 % (normal value: 80–100 %)] [4]. Similar to these reports, our patients also exhibited features of iron deficiency anemia, including pallor and low hemoglobin.

CONCLUSION

This case highlights the importance of early recognition and diagnosis of kwashiorkor, a severe form of protein energy malnutrition. The child presented with clinical features suggestive of protein deficiency and a history of hair discoloration, which may point towards nutritional deficiency. Timely medical and nutritional intervention led to clinical improvement, thus highlighting the need for prompt recognition and care in pediatric malnutrition.

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Conflict of Interest: The authors declare no conflict of interest.

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