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NOURISH TO FLOURISH DISEASE OF DEPOSED BABY

Paediatric Medicine

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ABSTRACT

The case described illustrates a classic presentation of kwashiorkor, a severe form of malnutrition caused by protein deficiency. This 7-month-old infant was brought in with progressive generalized swelling (anasarca), starting from the feet and progressing to the abdomen and face, mistakenly thought to be weight gain. Additional signs include dermatitis, fever, and hair changes (flag sign), which are diagnostic of kwashiorkor. The child's diet, which lacked adequate protein intake, coupled with a dilution of cow's milk and ragi contributed to the condition. The infant's socioeconomic status and insufficient caloric and protein intake exacerbated the malnutrition. Upon examination, the infant showed classic signs such as flexural dermatitis, hypothermia, and edema. The investigations revealed low haemoglobin and serum albumin, consistent with malnutrition. Treatment focused on correcting hypoglycaemia, hypothermia, and micronutrient deficiencies, while gradually increasing caloric and protein intake to avoid refeeding syndrome. Vitamin A, iron, zinc, and folic acid were supplemented to address deficiencies, and careful monitoring ensured safe recovery. This case highlights the importance of early diagnosis and intervention in malnutrition, focusing on balanced nutrition and micronutrient support.

KEYWORDS

Kwashiorkor, protein energy malnutrition

INTRODUCTION

Kwashiorkor is a severe form of malnutrition primarily affecting young children in regions where diets are deficient in protein. The condition is often seen in areas facing famine or limited food supply, particularly in developing countries. Kwashiorkor typically occurs when a child is weaned from breast milk and introduced to a diet high in carbohydrates but low in protein. The disease's hallmark symptoms include a swollen abdomen, skin lesions, hair changes, irritability, and stunted growth. The swelling (edema) is caused by fluid retention due to the lack of essential proteins that regulate fluid balance in the body. Kwashiorkor also weakens the immune system, making affected children more susceptible to infections, which can further complicate their health.

While treatable if caught early, kwashiorkor can lead to long-term developmental issues, and in severe cases, it can be fatal. Treatment involves the gradual reintroduction of protein-rich foods, along with vitamins and minerals to address deficiencies. Prevention focuses on ensuring access to a balanced diet, rich in proteins and essential nutrients, especially during critical growth periods in early childhood.

Case Report

A 7-month-old female infant brought to the emergency department of pediatrics with the complaints of progressive generalized swelling of the body for 1 week. Swelling initially started at the dorsum of the bilateral foot, progressed to abdomen and face since 4 months of age - misinterpreted as gaining weight. Child developed skin changes in form of redness of skin and peeling over the neck, leg and bilateral wrist. child had on and off fever for 10 days temperature not recorded, relived with paracetamol No history of feeding difficulty, reduced urine output, cough or loose stools

Term born, birth weight 3.2kg, exclusively breast fed till 2 months of age and under grandmother supervision and started on cows' milk in 1:1 dilution with water . At 4 months started on Ragi water (**table 1**). Belongs to socioeconomic class 3

Table 1 -showing Caloric Deficit

	OBSERVED	EXPECTED	GAP
CALORIES	140 KCAL	640 KCAL	500
PROTEIN	3gms	13gms	10

Examination

Child irritable, anasarca noted. Vitals – temperature – hypothermia (95.6)

Head to toe examination- flexural dermatitis **(fig 1)**

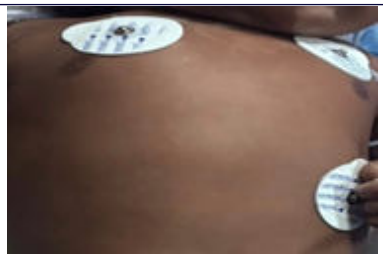

Fig 1 showing flexural dermatitis involving the neck region

Flag sign **(fig 2)** present (alternating hypo-pigmented and normal hair)

Fig 2 showing Flag sign

Generalised anasarca (fig 3)

Fig 3 showing generalised anasarca

Pedal edema (fig 4)

Fig 4 showing bilateral pedal edema

Differential diagnosis of protein loosening enteropathy, nephrotic syndrome, congestive cardiac failure and immunodeficiency was ruled out With the background of nutrition history and generalised edema, diagnostic skin changes and apathy in mental status diagnosis of kwashiorkor was made

Investigations

Complete blood count revealed – low hemoglobin (6.9), elevated total count (27,650), low platelet count (1.35), low serum albumin (1.6)

Treatment

Hypoglycemia	One episode of hypoglycaemia and correction given (5ml/kg 10%dextrose), Q 2nd hourly feeds were given
Hypothermia	Infant had hypothermia (34.4C) and rewarming measures were taken to control temperature
Dehydration	Not present
Electrolyte disturbances	Infant was given magnesium correction of 0.3 ml / kg iv and oral magnesium was continued for 15 days
Infection	Infant was started on 3rd generation cephalosporins and continued for 7 days
Micronutrient deficiency	3 doses of vitamin A given on day 1,2 and 14 (1 lakh IU), folic acid and zinc supplements started On day 12 oral iron was started
Cautious feeding	Infant was initially started on 75kcal/kg target nutrition feed and protein of 2g/kg and feed was given both orally and via nasogastric tube every 2nd hourly
Catch up growth	Infant daily weight was plotted, gradually after 3 days calories were increased to 100-120kcal/kg/day and protein of 3g/kg Q 2nd hourly feeding was continued. infant was monitored for Refeeding syndrome and electrolyte abnormality
Sensory stimulation	Emotional stimulation was done by mother vocalising with infant
Follow up	Infant was discharged after 14 days of hospitalisation, advised to continue vitamin supplements

Follow Up

On follow up visible reduction in edema noted(fig5), irritability reduced, and appetite improved. Weight gain of 5g/kg daily for three consecutive days was noted

Fig 5 showing reduction in edema

DISCUSSION:

1. Clinical Presentation:

The hallmark symptom of kwashiorkor is generalized edema, which results from severe protein deficiency leading to fluid retention in tissues. The progression of swelling from the feet to the abdomen and face, misinterpreted as weight gain, is a common feature in kwashiorkor. Additional signs in this case, such as dermatitis, the flag sign (alternating hypo- and hyperpigmented hair)(3), and hypothermia, reflect severe systemic impacts of protein malnutrition. The child also showed irritability, a common neurological symptom of kwashiorkor, which is often linked to the brain's inability to function optimally due to nutritional deficiencies.(1)

2. Nutritional Deficiency:

The infant's feeding history shows a significant protein deficit from early in life.(2)

Exclusive breastfeeding was discontinued after two months, and the introduction of diluted cow's milk and carbohydrate-rich foods like ragi water (a starch-based food) contributed to a caloric intake that was deficient in protein. Protein is essential for the synthesis of enzymes, hormones, and structural proteins, which explains the failure to thrive, anaemia, and edema in this infant. Early detection of these nutritional gaps is critical to prevent the progression to severe malnutrition.

3. Differential Diagnosis:

In this case, the differential diagnoses of nephrotic syndrome, protein-losing enteropathy, congestive heart failure, and immunodeficiency were ruled out based on clinical presentation and history. Each of these conditions can cause edema and may mimic kwashiorkor, but the absence of significant urinary changes, cardiac symptoms, or signs of chronic infections made kwashiorkor the most likely diagnosis.

4. Laboratory Findings:

The investigation revealed significant findings consistent with malnutrition: low hemoglobin (indicating anemia), hypoalbuminemia (low albumin levels), and elevated white blood cell counts (indicating infection). Hypoalbuminemia is a key biochemical marker of kwashiorkor, resulting from the lack of adequate dietary protein required for albumin synthesis. Additionally, elevated infection markers reflect the weakened immune system common in malnourished children

5. Management:

Treatment of kwashiorkor must be cautious due to the risk of refeeding syndrome, which can cause metabolic disturbances if nutritional rehabilitation is too rapid. The infant was initially started on low-calorie feeds with gradual increases in protein, along with the careful correction of hypoglycemia, hypothermia, and electrolyte imbalances. Essential micronutrients, including vitamin A, zinc, and iron, were administered to correct deficiencies and boost immune function. The monitoring of catch-up growth and sensory stimulation highlights the importance of holistic care in recovery (5)

6. Prognosis:

With appropriate treatment, the child showed improvement, as indicated by weight gain, reduction in edema, and improved irritability. This underscores the importance of early intervention and the role of nutritional rehabilitation in reversing the severe effects of kwashiorkor. Long-term follow-up is critical to ensure continued growth and development, and to monitor for potential complications, such as growth retardation or developmental delays due to early malnutrition(4)

CONCLUSION:

This case illustrates the profound impact of early nutritional deficits on a child's health and the critical importance of proper feeding practices during infancy. Early identification of kwashiorkor, coupled with appropriate nutritional and medical interventions, can lead to a favorable outcome, although long-term monitoring is necessary to ensure full recovery. This case also highlights the need for public health education regarding infant nutrition, particularly in communities where cultural feeding practices might predispose children to malnutrition.

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