CASE REPORT

An infant with kwashiorkor: The forgotten disease

Kamaruzaman NA, Jamani NA, Said AH

Kamaruzaman NA, Jamani NA, Said AH. An infant with kwashiorkor: The forgotten disease. *Malays Fam Physician.* 2020;15(2);46–49.

Keywords:
kwashiorkor, undernutrition, Malaysia

Authors:

Nurjasmine Aida Jamani
(Corresponding author)
Department of Family Medicine, Kulliyyah of Medicine, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, 25200 Kuantan Pahang, Malaysia
Email: minaida@iium.edu.my

Nor Azam Kamaruzaman
Department of Family Medicine, Kulliyyah of Medicine, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, 25200 Kuantan Pahang, Malaysia

Abdul Hadi Said
Department of Family Medicine, Kulliyyah of Medicine, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, 25200 Kuantan Pahang, Malaysia

Abstract

Undernutrition remains a major public health concern, especially in developing countries. Despite being rich in resources, Malaysia is still home to children suffering from severe undernutrition. This paper presents the case of a 5-month-old boy with kwashiorkor stemming from improper weaning which was overlooked. This case highlights the importance of recognizing the early signs of kwashiorkor to allow for early referrals for proper management and prevent its possible complications.

Introduction

Undernutrition remains a major public health concern, especially in developing regions such as Africa, in which three million children under the age of five die each year, constituting nearly half of global deaths in that category.[1] Undernourished infants and young children are at a greater risk of dying from common infections, as undernutrition not only increases the severity and frequency of such infections but also delays recovery.[1]

Malaysia, a country that is rich with resources, simultaneously faces crises of overnutrition and undernutrition. Based on the National Health Morbidity Survey, eight percent of children under 5 suffer from undernutrition and wasting.[2]

Undernutrition is caused by an insufficient intake of carbohydrates, fats, proteins, and micronutrients (vitamins and minerals).[3] Marasmus, kwashiorkor, and mixed marasmic kwashiorkor are the major forms of severe energy and protein undernutrition. This paper reports the case of an infant with kwashiorkor stemming from improper weaning which was overlooked.

Case report

A 5-month-old Orang Asli baby boy was referred to the visiting Family Medicine Specialist by a nurse for failure to thrive because his serial weight gain was unsatisfactory. He was born full term with a birth weight of 2.42 kg. His weight continued to rise through the second month but began to fall below the -2SD in the third month and below the -3SD in the fifth month, as shown in **Figure 1**. Over this period, he was assumed to be thriving, as neither parent noticed any physical changes. He had a good appetite and normal bowel function. He was breastfed exclusively until he reached two months, at which point the mother stopped breastfeeding due to inadequate milk supply. He was then fed sweetened condensed milk, water, and occasionally plain rice. He had no known medical illness.

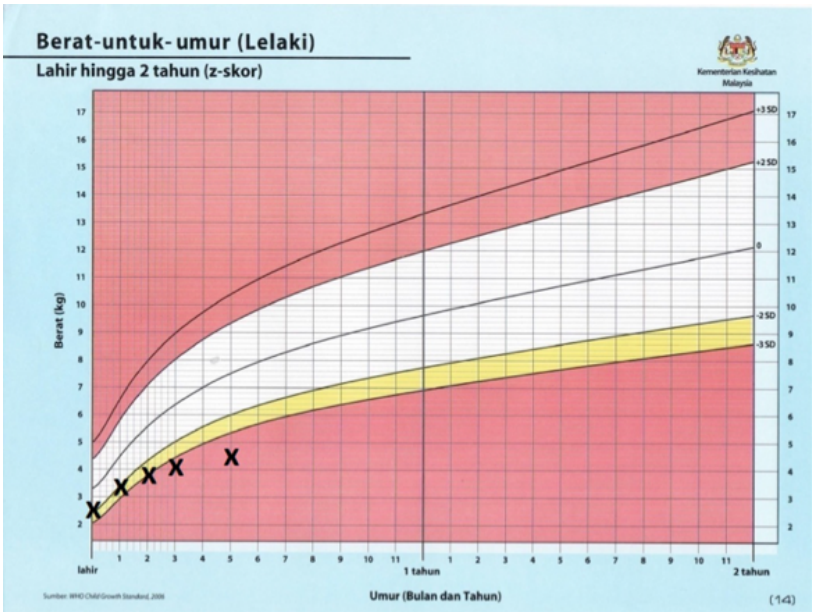

Figure 1: Serial weight-for-age measurement chart showing the baby's weight (-3SD).

After a clinical examination, his vital signs were found to be normal. His weight was 4.5kg (< -3SD) and his length was 57cm (< -3SD). He had prominent round cheeks resembling a cherubic appearance. (**Figure 2**). There were no signs of pallor, severe wasting, dehydration, or dysmorphic features. However, there was pitting edema visible in both lower limbs (**Figure 3**). Other examinations uncovered nothing of note. A developmental assessment showed that he is able to lie prone in the supine position and able to bear weight while standing. He exhibited no monosyllabic babbling.

Figure 2: "Cherubic appearance"

Figure 3 and Figure 4: Lower limb pitting edema

He was urgently referred to the hospital for severe acute malnutrition, as kwashiorkor was highly suspected. Laboratory investigations revealed a normal full blood count, but low serum protein and albumin levels. He was started on initial re-feeding with F-75, the "starter" formula, for one week before being given F-100, the "catch-up" formula. Emotional and sensory stimulation was provided throughout inpatient care. He was discharged after about one month to the outpatient clinic for a nutritional rehabilitation program. His first monthly follow-up showed that he was doing well; within six months, his weight had normalized.

Discussion

Kwashiorkor is a syndrome of severe protein malnutrition. It is characterized by symmetrical peripheral pitting edema that starts in the most dependent regions, hypoalbuminemia and dermatitis. It then proceeds cranially as time progresses, sometimes with anasarca.[3,4] It may also emerge alongside other micronutrient deficiencies, such as magnesium and zinc.[5]

Kwashiorkor has been reported in both developing and developed countries.[6] In developing countries, most cases emerge due to poverty and a lack of knowledge about healthy feeding methods. Calvalho et al. reported a similar case in which kwashiorkor was caused by the substitution of non-dairy creamer for milk.[6] In some cases, a diet for infants centered on rice milk, which is low in protein, has resulted in kwashiorkor.[7,8] One study from Bangladesh found that faulty breastfeeding practices were a primary driver of undernutrition in children.[9] Hence, the continuation of breastfeeding in infants under six months old is important.

The infant in our case was brought to the health clinic for a routine monthly check-up. Despite the fact that the infant's height and weight were on the lower standard deviation on the growth chart, his "cherubic" appearance, caused by fluid retention led untrained eyes to overlook the possibility of kwashiorkor.

Other physical findings of kwashiorkor may include rounded cheeks, pursed lips, dry peeling skin, sparse hair, hepatomegaly, bradycardia, and hypotension.[3,5,10]

The differential diagnosis of kwashiorkor in children includes congenital cardiac failure, glomerulonephritis, nephrotic syndrome, hepatic cirrhosis, hemolytic anemia, and protein-losing enteropathy.[3,4]

Kwashiorkor cases are difficult to diagnose and in turn, are often overlooked. This difficulty stems from the fact that generalized edema can mask decreased muscle mass.[11,12] If left untreated, kwashiorkor can lead to significant morbidity and mortality due to a greater susceptibility to and severity of infections.[3]

Therefore, it is crucial that all levels of primary

care are able to detect kwashiorkor. The World Health Organization has developed a strategy for reducing mortality and morbidity associated with major causes of childhood illness called Integrated Management of Childhood Illnesses;[13] this is an integrated approach that addresses the overall health of a child, including nutritional status. This strategy requires those on the front lines of health care to, when working with children under 5 years of age, take weight-for-age, check for severe wasting, and check for edema in both feet. This strategy promotes the accurate identification of malnutrition so that appropriate referrals can be made and effective management strategies can be adopted.

Specific investigations are generally unnecessary in the vast majority of children, as kwashiorkor is a clinical diagnosis.[5] Investigations are mainly done to look for underlying co-existing conditions, exclude other causes, and assess complications. Children with kwashiorkor usually have a very low plasma albumin concentration as a result of a lack of protein.[5–7] However, new evidence has recently emerged that there are multifactorial causes behind edema in malnourished children, such as oxidative stress and intestinal microbiome changes.[3,14]

The proper treatment for kwashiorkor is the gradual introduction of enteral feeds.[10] Nasogastric feeding is often required for severely affected patients. In developing countries, the mainstay of dietary therapy for kwashiorkor involves cow's milk.[6] While treating kwashiorkor, professionals should keep refeeding syndrome in mind, as it is a potentially lethal condition that can result from nutritional support.[9] The World Health Organization has formulated a three-phase management approach for severely malnourished children in which they are 1) resuscitated and stabilized, 2) started on nutritional rehabilitation, and 3) followed up on for recurrence prevention.[15]

Conclusion

Undernourished infants and children are not uncommon in primary care. However, kwashiorkor can often be overlooked if it is not consciously kept in mind. The case presented in this paper highlights the importance of a high index of clinical suspicion towards kwashiorkor. Proper dietary histories and thorough physical examinations are crucial for making an accurate diagnosis and prompt referral. Information on healthy breastfeeding practices and proper nutrition should also be made available to parents by the healthcare professionals.

How does this paper make a difference to general practice?

- It increases awareness among family physicians, medical officers, and nurses of the need to recognize the early signs of kwashiorkor.
- It stresses the importance of educating parents on breastfeeding as the optimum source of nutrition for babies.

References

1. UNICEF Data. *Malnutrition*. Available from: https://data.unicef.org/topic/nutrition/malnutrition/ [Accessed 27th March 2019].
2. Ministry of Health Malaysia. National health & morbidity survey 2015, volume 2. [internet] Putrajaya: Ministry of Health Malaysia; 2015 [Cited 20th March 2017]. Available from: http://iku.moh.gov.my/images/IKU/Document/REPORT/nhmsreport2015vol2.pdf.
3. Goday PS. *Malnutrition in children in resource-limited countries: Clinical assessment*. Available from: https://www.uptodate.com/contents/malnutrition-in-children-in-resource-limited-countries-clinical-assessment [Accessed 10th March 2019].
4. Williams CD, Oxon BM, Lond H. Kwashiorkor: a nutritional disease of children associated with a maize diet. 1935. *Bulletin of the World Health Organization*. 2004;81(12): 912–913.
5. Xavier MHSB, Magalhães E, Oliveira GF, Magalhães MK, Oliveira CPA, Oliveira, NB. A child with kwashiorkor misdiagnosed as atopic dermatitis. *Dermatology Online Journal*. 2017;23(5): 1–3.
6. Carvalho NF, Kenney RD, Carrington PH, Hall DE. Severe nutritional deficiencies in toddlers resulting from health food milk alternatives. *Pediatrics*. 2001;107(4): E46.
7. Diamanti A, Pedicelli S, D'Argenio P F Panetta, A Alterio, G Torre et al. Iatrogenic Kwashiorkor in three infants on a diet of rice beverages. *Pediatric Allergy and Immunology*. 2011;22(8): 878–879.

8. Grover Z, Ee LC. Protein energy malnutrition. *Pediatric Clinics of North America*. 2009;56(5): 1055–1068.

9. Sen S, Das Sharma J, Das D, Iqbal S, Badruddoza M. Faulty breast feeding practice: a risk factor in malnourished children. *Chattagram Maa-O-Shishu Hospital Medical College Journal*. 2015;14(2): 43–47.

10. Al-bar RH, Al-bar MH, Thigha RM. Case report: Kwashiorkor uncovered by Chickenpox. 2015;83(1): 561–566.

11. Liu T, Howard RM, Mancini AJ. Kwashiorkor in the United States: fad diets, perceived and true milk allergy, and nutritional ignorance. *Archives of Dermatology*. 2001;137(5): 630–636.

12. Schreiber R, Adelson JW. Kwashiorkor in an urban Canadian child. *Canadian Medical Association Journal*. 1985;133(9): 888–889.

13. World Health Organization. *Integrated Management of Childhood Illness (IMCI)*. Available from: https://www.who.int/maternal_child_adolescent/topics/child/imci/en/ [Accessed 27th March 2019].

14. Coulthard MG. Oedema in kwashiorkor is caused by hypoalbuminaemia. *Paediatrics and International Child Health*. 2015;35(2): 83–89.

15. World Health Organization. Management of severe malnutrition: a manual for physicians and other senior health workers. Geneva: WHO; 1999.