

Kwashiorkor skin lesions: case study on clinical presentation, management and patient caretaker perspectives in Maiduguri, north-eastern Nigeria

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Abstract

The management of kwashiorkor disease (KD) in children is challenging in resource-limited settings, especially for those cases with severe skin lesions and its complications. There are no evidenced-based management protocols specific to KD. This article describes the clinical presentation and case management of two children with different presentations of complicated kwashiorkor skin lesions and explores kwashiorkor from the perspective of the children's caretakers in Maiduguri, Nigeria. Our experience shows that a well-structured approach and careful skin care are crucial. This includes simplified wound care guidance, training of medical staff, strict hygiene measures and the correct choice of antibiotics and antifungals, taking into the account low immunity and vulnerability to opportunistic infections amongst malnourished children. Limited knowledge of kwashiorkor amongst caretakers negatively impacts health-seeking behaviour, resulting in late presentation. Engaging caretakers in the process of care is essential to successful treatment.

INTRODUCTION

Severe acute malnutrition (SAM) amongst children aged 6–59 months exists in two clinical forms: non-oedematous malnutrition (marasmus), defined by either weight-for-height z-score (WHZ) < –3 and/or a middle upper arm circumference (MUAC) < 115 mm, and oedematous malnutrition (kwashiorkor) defined by bilateral pitting oedema [1–3]. Both can co-exist as marasmic kwashiorkor (oedema plus WHZ score < –3). Whilst marasmic children are severely wasted with a skeletal appearance and often alert and hungry, kwashiorkor disease (KD) present with oedema of the limbs and face, discoloured brittle hair, enlarged liver, skin lesions and are often apathetic with a poor appetite [4].

Skin lesions of kwashiorkor include hyper-pigmented cracked patches, with hypo-pigmented areas underneath. It is a desquamating skin condition and in severe cases, ulceration might occur, becoming exudative with open skin lesions resembling burns [2]. This can lead to loss of serum and heat, with associated risk of hypothermia [1]. Importantly, these lesions can easily become infected and contribute to the vicious circle of infection and malnutrition [5].

Since 2017, Medecins Sans Frontieres (MSF) has been supporting an inpatient and outpatient therapeutic feeding centre in the protracted conflict zone of Maiduguri, Borno state, north-eastern Nigeria. For over a decade, clashes between non-state armed groups and government security forces have led to huge

population displacement and humanitarian suffering including malnutrition.

In MSF Maiduguri nutrition programme, children with kwashiorkor represent 5–13% of monthly admissions, peaking during the annual 'hunger gap' (May–September). Most children present with complications including severe skin lesions and sepsis. Whilst the aetiology of kwashiorkor remains elusive [4], there is also little published information on how to manage its dermatological aspects.

Therefore, this case study describes the clinical presentation, case management, challenges and lessons learnt of two children with different presentations of kwashiorkor complicated skin lesions. We also explored kwashiorkor from the perspective of the children's primary caretakers.

METHODS AND PATIENTS

This case study included two children admitted with different presentations of KD, between June and September 2019. During this time, the project implemented a new MSF wound care protocol for KD (see [Figure 3](#)). SAM was diagnosed and treated in accordance with the WHO guidelines [2, 6, 7]. Data collection included a full review of patients' medical records, analysis of photographs to assess clinical progress and discussion in the local languages with caretakers to explore their understanding of kwashiorkor and experiences of care. Written informed consent

Received: January 12, 2022. Revised: April 24, 2023. Accepted: May 4, 2023

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Table 1. Skin lesions description and skin care provided for the two cases admitted with kwashiorkor complicated with kwashiorkor dermatosis, at MSF's nutrition programme, Maiduguri, north-east Nigeria.

Cases	Skin lesions description	Skin care provided
(Case 1) Extensively infected skin lesions	Areas of wet and dry skin lesions covered more than 75% of body including the face, trunk, upper and lower limbs, and with signs of infection primarily around the perineum.	As per the MSF wound care protocol, dry skin (no or minor exudates) lesions were cleaned with normal saline and hydrated with Vaseline. The wet (exudates ++++) infected lesions on the buttocks were cleaned with chlorhexidine 0.5% aqueous solution and covered with sterile dressings and zinc oxide on the peri-wound area. Dry skin lesions were cleaned with normal saline and silver sulfadiazine cream was applied. The caretaker was counselled about how to appropriately clean their child, especially with respect to the prompt removal and cleaning/drying after the child had passed urine or faeces. To control skin infection, blankets and bed sheets were changed on a daily basis. Mosquito nets were also used during the day to avoid contact with flies.
(Case 2) Necrotic skin lesions	On the left leg, two well-defined, black, hard, dry, painless plaques were found over the posterolateral area of knee and hip joint, approximately measuring 3 and 6 cm in diameter, respectively. The dry necrotic plaques resembled pressure ulcers and were surrounded by reddish skin lesions with purulent discharge, indicating infection. Additionally, desquamating lesions covered about 50% of the body, with no signs of infection.	In addition to the skin care described in Case 1, necrotic plaques were initially left in place, cleaned with chlorhexidine 0.5% aqueous solution (two times per day) and dressed with sterile gauze. Pain management with acetaminophen and tramadol whenever needed.

**Figure 1.** Case 1- extensively infected skin lesions : evolution from admission to discharge.**Figure 2.** Case 2- necrotic skin lesions : evolution from admission to discharge.

was obtained from the caretakers prior to the initiation of the case study.

RESULTS

Case 1: extensively infected skin lesions

A 2-year-old boy presented with generalized oedema, weakness and skin lesions that had developed over 3 weeks (Figure 1). During that period, the child had been admitted for 3 days in a cholera treatment unit with watery diarrhoea and dehydration. On examination: WHZ score < -3 (weight 8.1 Kg, height 66.5 cm), MUAC 116 mm and bilateral oedema in the feet, legs and hands (grade ++++). Vital signs: temperature 37°C; respiratory rate 42 (br/min) and heart rate 122 bpm. The boy looked unwell with general weakness; he was lethargic and apathetic. Heart

auscultation showed no murmurs. Chest was clear. Abdomen was soft and painless, and liver was enlarged. Extremities were cold, with weak pulses and prolonged capillary refill time (>3 s). Laboratory examinations showed: Hb of 11.6 g/dl, elevated blood glucose (291 mg/dl) and hyponatremia (120 mmol/L). Skin lesions are described in Table 1. The child was diagnosed with marasmic kwashiorkor complicated with septic shock because of extensively infected skin lesions. He was admitted to intensive care unit, with constant monitoring of blood glucose, initially was put on Nil per Os for stabilization, received intravenous (IV) fluids (Ringer's lactate) and started on broad spectrum antibiotics IV ceftriaxone, cloxacillin and fluconazole. Skin care is described in Table 1.

On Day 2, the child had improved vital signs and the blood glucose monitoring was normal. He started feeding with F-75 via a nasogastric tube, as per guidelines. Despite the initial

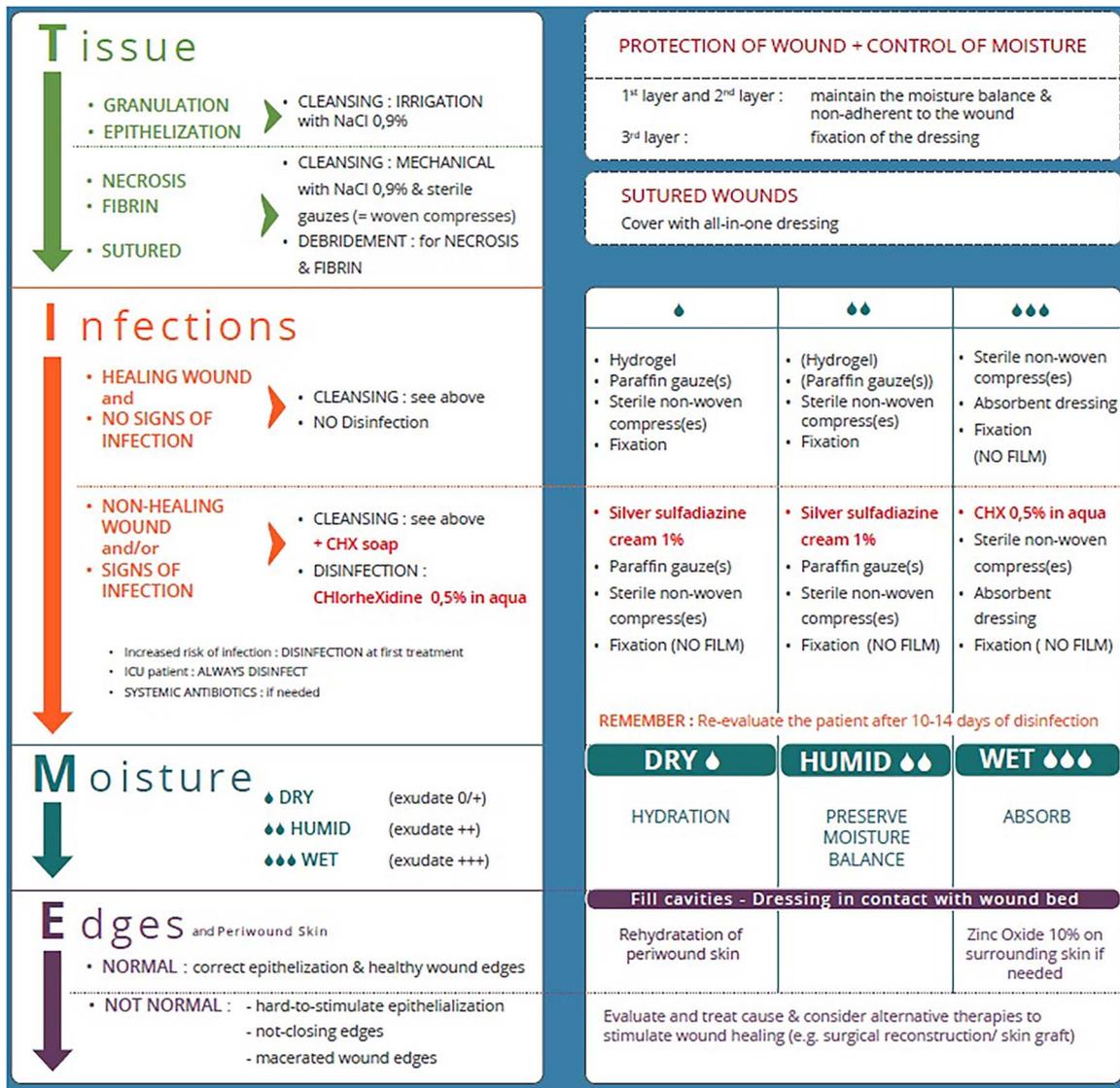


Figure 3. MSF Wound Care Protocol.

improvement, he had peaks of fever, loose stools and no improvement of the oedema. On Day 10, because of persistent fever and cold extremities, decision was taken to change the antibiotic from cloxacillin to clindamycin. From then on with intensive skin care as per MSF wound care protocol, the child started to slowly improve, becoming more active, passing normal stools, fewer fever spikes and reduced oedema. By Day 14, the oedema had reduced, and the nutritional treatment was changed to F-100 and then to Ready to Use Therapeutic Food (RUTF) the following day. With these changes, the skin started to slowly re-epithelise, and wet skin lesions started to dry up although the child was still apathetic.

As the child had recurring spikes of fever, he was screened for tuberculosis (TB): there were no signs on chest X-ray and no history of contacts with a TB patient. On Day 20, antibiotics were changed to amoxicillin and clavulanate. Dry skin lesions progressively desquamated and the wet lesions re-epithelised. The most difficult body area to treat was the perineal area, because of continuous contamination with the passage of loose stool. The fever finally stopped after the wet skin lesions were healed. The child was discharged after 34 days of admission with no fever or

oedema, and healed skin lesions with no scarification. Discharge weight was 10.15 Kg.

Case 2: necrotic skin lesions

A 3-year-old girl was referred from another hospital after 2 weeks admission there. The child had kwashiorkor with necrotic skin lesions on her left leg (Figure 2) that had shown no improvement with cloxacillin and F100. On examination: WHZ < -3 score (weight 8.6 Kg, height 87 cm), MUAC 102 mm and bilateral oedema in the hands and feet (grade +++). Vital signs were: temperature 38°C, respiratory rate 36 (br/min) and heart rate 136 bpm. The girl was apathetic with sparse discoloured hair. All other systems were normal. Skin lesions are described in Table 1. The child was diagnosed with marasmic kwashiorkor complicated with necrotic skin lesions secondary to pressure wounds. She was already receiving oral cloxacillin, without improvement; it was switched to clindamycin. Feeding continued with RUTF as she was already on Phase 2 of feeding treatment. Skin care: see Table 1.

The girl continued to have recurring fever and the necrotic lesions continued to ooze pus. As no improvement was noticed after 72 h of treatment, ceftriaxone IV was added. The child still

showed no improvement, with high fever, and thus metronidazole was added on Day 7; thereafter, the fever started to subside. After 7 days of antibiotics (metronidazole, ceftriaxone and clindamycin), and no further fever, antibiotics were changed to oral amoxicillin and clavulanate. Necrotic plaques fell off spontaneously around Day 15.

Whilst the child was gaining weight and improving, she had difficulty moving her left leg, unable to extend it with an effusion over her left knee. On Day 25, a suspicion of a septic arthritis was raised. Therefore, the child was reinitiated on ceftriaxone and clindamycin, an X-ray was done, and the child referred for surgical consultation. Septic arthritis was ruled out by the surgical team of another humanitarian organization and antibiotics were discontinued. Bed-side physiotherapy of the affected limb was commenced by the nursing team and the caretaker. The child continued to improve, gaining weight, with the open skin lesions gradually closing; she was discharged to outpatient nutritional care after 38 days of admission, walking and playing. Discharge weight was 10.5 Kg.

Caretakers' perspectives

To explore kwashiorkor from the perspective of the children's caretakers, one-to-one discussions were held with the assistance of a translator. Three main areas emerged that have implications for programmatic improvement.

1. Limited knowledge or understanding of kwashiorkor at the individual and wider community levels negatively impacted health-seeking behaviour. Cultural understanding led caretakers to initially use informal pharmacies and traditional medicines, which delayed presentation to formal health care.

CGV 1 "People believe that this illness is caused by the sun... making the bodies swell up. There is a traditional medicine that can be given to treat this illness. It's just a tree. If you go to the market [...] they will give it to you already prepared. It's in a powder form, and you mix it with water and then you give it to the child... then it will kill the warmth inside the body and the illness..."

2. Primary caretakers perceived the quality of care provided to be high, but they did not fully understand what the treatment comprised. Communication between the medical team and the caretaker regarding the diagnosis and care of the patient was identified as a neglected component. Caretakers described their frustrations with very limited communication between them and the health team, and their subsequent inadequate understanding of kwashiorkor as a form of malnutrition.

CGV 2: "Apart from the skin wounds, I don't know why she is here [...] No one has told me what the problem is with [my daughter]. I would like to know more about what it is so that I can understand better."

CGV 1: "I was worried. Seeing how my child was, and the intensity of the treatment he was receiving I started to lose hope that the child would not make it ... I wanted to know what was happening. I even asked someone to explain to me what was happening. But nobody did."

3. The critical role of primary caretakers in the process of care, particularly in relation to major responsibilities for the hygiene and nutrition of the child, was acknowledged. They described their willingness to be actively engaged in provision of care, detailing some specific tasks they had received instruction on; however, they needed further knowledge and support to fully cooperate with treatment plans.

CGV 1: "I have no option [but to look after] my child. [...] I was happy about the things I was asked to do, I was happy to know about these things so that I can help him to get better."

CGV 2: "They taught me how to do physiotherapy for the child, especially for the limbs, because without this she would not be able to stand again. [...] They asked me to clean the baby very well. If I am going to feed my baby, I should wash her face and mouth. And to take care of her hygiene."

These findings highlight the need to strengthen knowledge and referral pathways at the community level for more timely access to care. Within the health structure, a more proactive approach to communication with patient caretakers is needed to address inadequate knowledge of kwashiorkor diagnosis and ensure full engagement with treatment.

DISCUSSION

Our case study highlights important lessons for managing KD in resource-limited settings. The two children presented with extensive skin lesions and sepsis, one infected in the perineal area and the other with large ulcerating lesions.

In this context, without cultures available to detect antibiotic sensitivity, antibiotic choice should include broad spectrum coverage and effectiveness against common skin pathogens (staphylococcus and streptococcus). Additionally, as SAM children have low immunity [4], facilitating opportunistic fungal infections, antifungal medication may be necessary [8].

Because of the deficient nutritional state and immunological vulnerability of the children as well as the fact that the cause of the skin lesions still not fully understood, wound care must be 'empirical'. However, following a specific wound care protocol, such as MSF's, is recommended and should not be overlooked as part of management of SAM children. This includes training of staff for wound assessment and treatment based on key principles: a holistic approach, appropriate cleansing of the wound, rational use of antiseptic and wound bed preparation on a balanced moist environment [5].

An important aspect of care is hygiene measures to prevent further infection. Care should include: cleaning the skin after passing stool and urine or considering the use of urinary catheter, changing bed sheets daily, using mosquito nets to prevent flies from landing, cutting nails to avoid scratching and pain management for comfort [5]. Careful infection control measures for staff, especially hand hygiene, need to be followed. Consumables and appropriate wound care products, such as sterile gauze, bandages, antiseptic solution, hydrating cream and zinc oxide ointment, need to be available and correctly used (e.g. no adhesive on damaged/

sensitive skin). In this setting, despite personal hygiene advice given to caretakers, care of the perineal area was not optimal.

During treatment, the timing and type of therapeutic feeding plays a significant role in the recovery and regeneration of kwashiorkor skin lesions. Re-feeding the child should start when all signs of shock are resolved, the child is awake and has no signs of ileus (abdomen is soft, non-distended) [8]. Moreover, the duration in Phase 1 with F-75 feeds should be monitored, and not shortened, as patients need time to recover from oedema. Conversely, there is a need to increase calories and protein through a timely transition to F-100 and/or RUTF, as soon as the child shows signs of recovery [8].

One important aspect, and often neglected, is the caretaker's understanding of the child's illness and needs. This was observed in our project, where many caretakers did not perceive kwashiorkor as a type of malnutrition. This influenced their health-seeking behaviour and led to late presentation, often complicated with sepsis. Health promotion in the community should focus on raising awareness of kwashiorkor as a disease.

In addition, communication between the medical team and caretakers on the diagnosis and care of the patient should be improved. The role of caretakers is essential in the treatment plan, as they become the essential factor to ensure the children's hygiene and nutrition, specifically in cases with compromised skin barrier and high risk of nosocomial infections.

Operationally, an important factor is that hospitalization of complicated KD can be quite long (our cases were 34 and 38 days); this has a major impact on bed occupancy. Treating these patients optimally would reduce admission time, but care centres should anticipate longer admission periods for these patients, especially during peak periods of admissions (e.g. hunger gap and measles outbreaks) [9]. An outpatient service, where we could attend stable patients with regular dressing changes could also be an alternative to shorten the admission times.

In conclusion, Kwashiorkor skin lesions are an important complication of kwashiorkor, increasing a child's vulnerability to sepsis. Management of these cases is challenging in resource-limited contexts, demanding a well-structured approach. This case study points to key elements of care: better use of antibiotics, fastidious care of skin lesions, excellent hygiene measures and engagement of caretakers.

ACKNOWLEDGEMENTS

We would like to thank Tony Reid for his editorial help.

CONFLICT OF INTEREST STATEMENT

None declared.

FUNDING

Not required.

INFORMED CONSENT

Written informed consents were sought and obtained from the two caregivers.

DATA AVAILABILITY

Data resulted from this study are available from Medecins Sans Frontieres on reasonable request.

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