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# Supplementary suckling technique with expressed breast milk can increase the belief in breastfeeding

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## Abstract

In Tanzania in 2015 more than 100,000 Severe Acute Malnourished (SAM) cases were estimated, with high risk of dying. SAM infants under-6 months (U-6 mo) need special care and should always be treated as inpatient. If it is possible to restore Exclusive Breast Feeding (EBF), therapeutic feeds can be best delivered by the Supplementary Suckling Technique (SST). A male infant, born at term with a body weight (BW) of 3100 g, was admitted in hospital at 6 weeks of age with a BW of 1550 g. The child was diagnosed as marasmatic SAM. He was started on therapeutic milk administered by SST. Mother was instructed in proper SST use and counseled in order to re-establish effective EBF. As weight gain was maintained, SST was stopped and the child was put on EBF, but BW started to decrease again. SST was then applied using Expressed Breast Milk (EBM), gradually stepped down and stopped. Since BW started to decrease again it emerged that the mother decided by herself to start again to administer EBM by SST but in insufficient quantity. She was invited to breastfeed frequently under supervision, creating a better awareness of breastfeeding practices. Since the child showed correct weight gain on EBF he was discharged, with a BW of 2420 g. According to our experience SST with EBM could be useful in developing countries to increase awareness and belief on successful breast feeding.

## Keywords

supplementary suckling technique; expressed breast milk; breastfeeding; nutritional rehabilitation; severe acute Malnutrition

## Abbreviations

SA: Severe acute malnutrition; U5y: Children under 5 years of age; U-6mo: Infants under 6 months of age; WHO: World Health Organization; EBF: Exclusive breastfeeding; SST: Supplementary suckling technique; DOL: Days of life; W/L SD: Weight for length standard deviation; BW: Body weight ; EBM: Expressed breast milk

## Introduction

Severe Acute Malnutrition (SAM) remains a major cause of child mortality worldwide. Severe wasting is estimated to account for around 400,000 child deaths each year [1].

The National Nutrition Survey conducted in 2014 showed an important decrease in the prevalence of malnutrition among children under 5 years (U5y) in Tanzania [2]. Despite this progress, in 2015 more than 100,000 SAM cases were estimated, with high risk of dying without appropriate intervention [2].

The 2010 MAMI-1 report was one of the first to explore acute malnutrition in infants under 6 months of age (U-6mo) in detail. Despite a dearth of evidence it documented higher mortality among infants U-6mo than among children from 6 to 59 months within the same nutrition programs. New World Health Organization (WHO) guidelines for the management of SAM include this age group for the first time [1].

U-6mo need special care and should always be treated in inpatient care until full recovery, to improve or re-establish Exclusive Breastfeeding (EBF), provide therapeutic feeding and medical care for their caregivers.

For inpatients who have the possibility to restore EBF, therapeutic feeds can be best delivered by the Supplementary Suckling Technique (SST) which consists in giving therapeutic milk through a fine tube that runs alongside the nipple, allowing in the meanwhile breast milk production by the suckling stimulation [3].

## Case Presentation

An exclusively breastfed male infant, 6 weeks old, was admitted in the hospital located in a rural area in the south of Tanzania.

He was born at home at term to a primigravidae mother by Spontaneous Vaginal Delivery (SVD) and admitted in the nearest health facility within 24 hours of life; Body Weight (BW) was 3100 g (grams). Length was not registered. He left the facility in suitable health status, on EBF. Pregnancy was unremarkable. As it is expected by the Tanzanian Ministry of Health, Community Development, Gender, Elderly and Children, the baby was supposed to be reviewed at age 7, 28 and 42 days of life (DOL). The mother attended the follow up at 10 DOL (BW 3800 g) and at 42 DOL when BW was 1800 g.

The infant was then referred to the hospital. He was weighted using the scale supplied by the hospital, with a 0.05 kg precision. Length was assessed by an infant length-board with a 0.1 cm precision. On admission, at 43 DOL, BW was 1550 g, length was 44 cm. Weight for length Standard Deviation (W/L SD) was supposed to be <4SD. Since there is not a globally recognized gold standard in diagnosis for U-6mo [4,5] and no criteria are provided for length < 45 cm, the child was admitted as a case of marasmatic SAM based on clinical findings [5]. He was below the third percentile on a weight-for-age chart (WHO Child Growth standards 0-2 years old boys).

On physical examination he had no oedema, he was lethargic and hypothermic (body temperature, BT, 33.2 °C). Random blood sugar value was 2.8 mmol/L. Other laboratory investigations were normal.

The patient's family history revealed a 21 years old mother without income, living with her own mother in a poor social environment.

According to national guidelines [3], the infant was started on therapeutic milk (F100-diluted)

administered by SST every 3 hours after breastfeeding. Mother was instructed by the staff in proper SST use and counseled in order to prioritize and re-establish effective EBF.

Daily therapeutic milk amount was calculated according to BW assessed every day [1]. For the first 10 days 30 ml every 3 hours were administered by SST. Since BW increased more than 20 g per day [3], feeds were reduced to one-half each (15 ml of milk/feed) for the next 5 days. As weight gain was maintained (10 g per day), SST was stopped and the child was put on EBF. Even if the mother had enough breast milk, after 5 days of breastfeeding BW would start to decrease again. The child was not yet able to latch properly to the breast.

In order to assess the amount of milk taken by the infant and facilitate breastfeeding, besides assisting positioning and attachment, medical staff decided to apply SST while using Expressed Breast Milk (EBM), starting on day 20 since admission with the amount of 150 ml/kg/day [1,7], continuing breastfeeding on demand. After 5 days, according to BW increase, the supplemental milk volume was gradually stepped down, and completely stopped as an appropriated breastfeeding was re-established. After some days, BW started to decrease again. It emerged that the mother had decided by herself to administer EBM with SST but in the wrong amount. She was subsequently counseled and invited to breastfeed frequently under the supervision of the staff.

In that period another weighting scale with a 0.01 kg accuracy became available in the ward, allowing a better BW monitoring, registering a progressive increase under EBF during the last week of admission.

The child was discharged and addressed to the Outpatient Treatment Care (OTC) by day 43 since admission: his BW was 2420 g and his length 47 cm.

The infant received treatments recommended by guidelines [3].

One week after discharge a slight BW increase was registered (BW 2490 g). No other problems were reported.

## Discussion

According to our knowledge few cases of SAM children U-6mo born at term after normal pregnancy and delivery, from low-income countries, are reported in literature [6,8].

Kerac et al [4] underline the importance of treating malnourished infants U-6mo to avoid malnutrition-associated mortality in the short term and adverse outcomes in the long term, stressing on EBF wherever possible.

According to the collected history, child undernourishment may have been due to inadequate breastfeeding. Even if Insufficient Milk Syndrome (IMS) is acknowledged, low nursing frequency and unfavorable maternal psychological status likely play major roles in inadequate milk supply [6]. These can be the reasons of progressive weight loss in newborns that would lead to SAM. Any eventual obstacle for an adequate breastfeeding must be identified and overcome, especially in young and primigravidae mothers [6,9].

SAM children U-6mo with marasmus are often unable to suckle properly and tend to get tired before adequate milk intake has been ensured. Because of this SST at the beginning of the treatment is

crucial. Recommended therapeutic milk is F100 diluted [3].

Given that the BW restarted to decrease during EBF, it was increasingly likely that the mother was unaware of the inefficient suckling. Since breast milk was enough, in order to facilitate proper attachment, medical staff decided to administer SST using EBM instead of therapeutic milk. In literature it is documented that SST can successfully improve breastfeeding technique and frequency, and reinforce mothers' confidence [6], while EBM it is known to be useful to continue breastfeeding, keeping a good production of breast milk [3,10].

As an appropriated breastfeeding was re-established, the amount of EBM by SST was stopped. The mother seemed to become more aware of breastfeeding practices. Once the child showed weight gain for 3 consecutive days on EBF and clinical wellness he was discharged and addressed to the OTC despite the current weight or weight-for-length, as guidelines recommend [1].

## Conclusion

SAM is increasingly being diagnosed in U-6mo because of suboptimal breastfeeding. Yet, rates of EBF worldwide remain disappointingly low [1,9]. Based on our experience it should be underlined the importance of establishing a trusting relationship with the mother to support the dyad and increase belief on successful breastfeeding. For inpatients who have the possibility to restore EBF, therapeutic feeds can best be delivered by SST increasing the mother's awareness of the quantity of milk taken and needed by the child [4,10].

SST with EBM could be a useful and affordable procedure in developing countries although further evidence is needed to improve effectiveness of use and patient selection.

## Limits

Considering the low-resource setting, it should be acknowledged that accuracy of the staff and available means were not always adequate.

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