Management of severe acute malnutrition in children using community based therapeutic care approach: a review of three years data from southern Ethiopia.

Efrem Teferi, MD[1], Shiferaw Teklemariam, MD, MPH[1] , Lopiso Erosie, BSC, MPH[1] , Abel Hailu, MD[1]
Tefera Belachew, MD, MSc, DLSHTM[2], Mohammed A Yassin, MD, MSc, PhD[1,3]

Abstract

The objective of the study is to assess the outcome of community-based therapeutic care (CTC) for children with severe malnutrition in Southern Ethiopia. Diagnosis of severe malnutrition was made based on anthropometric measurement and all children received therapeutic food according to the protocol and were discharged from the feeding program when they their weight for height was more than 80% of the reference for 2 consecutive weeks. Data on the number of admissions, discharges, weight gain and length of stay in the program were recorded using standard formants and reports were sent to the Regional Health Bureau monthly. The data was entered using EPI-Info proportions and means were compared using chi-square test. This is a retrospective review of reports retained in the Bureau. A total of 12,316 patients with severe acute malnutrition, 56.2% marasmic and 43.8% kwashiorkor cases were treated in CTC program from 2003 to 2005. The average cure and death rates were 91% (9871) and 2.5% (217) and the average weight gain was 5.3 and 5.8 grams /kg/day and the average length of stay was 49 and 42 days for cases of Marasmus and Kwashiorkor, respectively. Except for weight gain and length of stay, our findings exceeded the minimum sphere standards for treatment outcome measures. In conclusion the CTC approach has a comparable outcome to Therapeutic feeding centers and could be expanded quickly during emergency situation. As majority of patients are treated at home, the workload for the health worker would be reduced, so it is an alternative approach for management of severe malnutrition where human resource and space in health facilities are limited.

Introduction

Ethiopia has a long history of food insecurity and nutritional problems affecting a large proportion of the population. (1) Even during a relatively non-drought years, malnutrition in children in Ethiopia is extremely high exposing the survival of this group of the population at a great threat. An estimated 47% of Ethiopia's under-five children are moderately or severely stunted contributing to an under five-mortality rate of 123/1000 live births. (2) Ethiopia stands 6th among countries with the highest number of under-five deaths in the world, with more than 472,000 under-five dying each year, (3) Malnutrition, even in its milder form, accounts directly or indirectly for 53% of all under-five deaths in Ethiopia (4).

The Southern Nations, Nationalities and Peoples Regional State (SNNPR) is located in southwestern part of the country and has a population of about 14 million. The region is divided into 14 administrative Zones and 8 special Woredas (districts) with a total of 104 Woredas. There are 56 nationalities in the region , which gives it the unique feature in encompassing rich and diverse culture. According to the 2005 Regional Health Bureau annual report, there were 16 hospitals, 160 health centers, 1336 health posts with potential health service coverage of 50%. The regional ; DPT3 coverage was 90%, family planning 47%, antenatal care 60% and deliveries attended by health professionals of 18%. The major causes of mortality among children under five years of age are pneumonia, diarrhea and malaria.

Malnutrition has become a common feature occurring in the region in recent years with large-scale famines reported in 2003 and cases continuing to be reported. Dependency on rainfall, poor resource management, uncontrolled population growth, poor farming planning and limited food reserves of households complemented with failure of rains in 2002 exacerbated the living condition of vulnerable communities leading to exhaustion of coping mechanisms.

In response to the recent famine, many international humanitarian agencies and the government opened Therapeutic Feeding Centers (TFC) to mitigate the crisis. A Decentralized therapeutic program was initiated with Concern, Save the Children US in collaboration with other international organizations. In 2004, the Ministry of health in cooperation with UNICEF initiated enhanced outreach strategy (EOS) for child survival. This involves screening for malnutrition, Vitamin A supplementation, strengthening immunization and health education for child survival and was started in 54 woredas of the region (17) and expanded to the entire region in 2006.

Improvement in child survival is strongly associated with decrease in malnutrition in countries characterized by high rates of general malnutrition such as in Ethiopia (5-7). To reduce mortality due to severe acute malnutrition, TFCs were established in SNNPR in 2003, which provided a high quality individual inpatient care and patients receive formula 75 (F75) and formula 100 (F100) milk with routine drugs (18). A high cure rate (87.2%) and a relatively low death rate (3.6%) was reported from 25 TFCs opened in the region in 2003-05 with an average length of stay of patients of 21-25 days (8). This high intensive care phase of treatment is very important for patients with complicated malnutrition associated with anorexia, septicemia, hypothermia, hypoglycemia and severe dehydration. However, management of children with malnutrition in TFC requires skilled staff, room for inpatient care, materials including bedding, cooking utensils and caretakers' food (8-11). The centers were opened and ran by non-governmental organizations (NGO) and coordinated by the regional health bureau. When the activities were integrated into the routine health services and handed over to health facilities, it was difficult to continue with the limited work force, space and resource in the facilities.

The traditional model of inpatient treatment of severe acute malnutrition (SAM) does not consider the social aspects of management of malnutrition and hence has high opportunistic costs to mothers/care givers (9). Mothers/care givers had to stay in centers for several weeks leaving their other children and family members at home and hindering them from their daily activities. Community therapeutic care (CTC) is a nutritional intervention designed with the capacity to address SAM in both emergency and development contexts (9). Its underlying aims are to maximize coverage and access. In practice, this means giving priority to provision of care for acutely malnourished over inpatient care for a few extreme cases.

CTC was introduced in SNNPR in 2003 and expanded in 2004 and 2005. It integrates supplementary and therapeutic feeding with an emphasis on outreach and community based support. In out patient therapeutic program (OTP), the therapeutic product used is ready to use (plumpy nut and BP 100 biscuit) with outpatient drug treatment protocol. There were few referrals for inpatient treatment, which includes those with complication and who were admitted in stabilization centers (SC) and treated for few days and referred to OTP like in phase one TFC (13). During emergency, CTC approach can quickly provide good coverage and treatment for a large number of severely malnourished people. This paper reviews reports of CTC to assess the outcome of malnourished children treated in community therapeutic care established in the southern Ethiopia and compared with the results of children treated in TFC.

Materials and methods

Children with severe acute malnutrition were admitted to therapeutic care established in response to the famine encountered in the region. Diagnosis of severe malnutrition was made based on anthropometric measurement and brief examination for bilateral pitting pedal edema. At admission, patients were assessed for hydration, anemia and signs of infection. Patients were given oral doses of Vitamin A, Folic acid, Amoxicillin (5-day course), Mebendazol, treated for dehydration with Resomal and given ready to use therapeutic food (RUTF) according to the protocol (18). Patients were discharged from the outpatient therapeutic feeding program when their weight for height was more than 80% of the reference for 2 consecutive weeks and if they did not have signs of infection. They were followed in supplementary feeding program until they reach 85% of the reference for 2 consecutive weeks. At each follow up visit, weight, extent of pitting edema, presence of infection and treatment were recorded. In CTC, plumpy nut was used instead of F100. The main difference between F100 and plumpy nut is that part of dried skimmed milk in the F100 was replaced with peanut butter (with a 25% total weight). Plumpy nut has an energy density 5 times more than that of F100. Plumpy nut was used in all the centers except for few weeks when BP100 was used due to shortage of plumpy nut.Data on the number of monthly admissions, discharges, average weight gain and length of stay in the program were recorded in each therapeutic centre using standard formants and reports were compiled by the health facilities and NGOs supporting the programs and were sent to the Regional Health Bureau (RHB) monthly. The data was entered using EPI- Info programme(CDC Atlanta) and analyzed using descriptive statistics, proportions and means were compared using chi-squared test and p values value <0.05 was considered as significant.

This is a retrospective review of reports retained in the RHB. All reports from CTC sent to RHB were included in this paper, except reports of 243 cases from Kembata Tembaro zone and 44 admissions from Sidama Zone because of incompleteness. Patients who were defaulters, referrals and non-respondents were excluded as their outcome was not known. Ethical approval was obtained from the SNNPR Health Bureau.

Results

A total of 12,316 patients with severe acute malnutrition, 56.2% marasmic and 43.8% kwashiorkor cases were treated in CTC program from 2003 to 2005. Of these, 1540 (12.5%) were treated in 2003, 1955 (16%) in 2004 and 8791(71%) in 2005. The majority (90%) of the cases were age between 6 months to 5 years old. The average cure and death rates for the region were 91% (9871) and 2.5% (217) respectively. The highest (99%) cure rate was recorded in Boricha and Damot Gale districts (Woredas), while the lowest cure rate (80.6%) was observed in Malgano in Sidama zone. Death rate above minimum standard was not reported from any of the CTC, the highest death rate (8.4%) was reported from Bedessa and the lowest (0.4%) in Arbegona as shown in Table 1.

The number of admissions was not the same as the number of cases discharged, as some of the cases were on follow up when the report was compiled. There were also cases that defaulted from the program, referred to other places and non respondents making the total number of cases discharged higher than the sum of deaths and cured cases.

The average weight gain for the region was 5.3 and 5.8 grams /kg/day for cases with Marasmus and Kwashiorkor, respectively. The average length of stay was 49 and 42 days for marasmic and Kwashiorkor cases, respectively ($p > 0.05$ for both) as shown in Table

2. The outcome of patients treated in CTC was comparable to those treated in TFC in the region during However, there was statistically significant difference in the mean length of stay which were 21 and 25 vs. 42 and 49 days for marasmus and kwashiorkor patients respectively and the average weight gain of 13.4 and14

Discussion

Given the spatial arrangement of health service units and their limited capacity to handle a large number of cases of severe acute malnutrition during emergency and crisis in Ethiopia, seeking an alternative solution for management of such cases cannot be overlooked. Community base therapeutic care provides a promising alternative option to the TFCs and facility-based stabilization centers (9-12). Though CTC cannot totally replace an inpatient therapeutic care as some cases with complications, such as infections, may still need an inpatient care, it is complementary to therapeutic and supplementary feeding programs (9).

The experience in implementing therapeutic feeding programs in the region in the last few years enabled us to understand and expand CTC very quickly. The total number of cases treated in the region (12,316) was sizable enough to assess the outcome of the therapeutic feeding programs. Overall, the outcome of patients treated in the CTC approach were promising considering the minimum sphere standards for the outcome indictors of therapeutic feeding programs (9-11,15,). In addition, CTC handles the majority of cases by creating access and capacity which is very difficult to meet during emergency situation (9-11). The outcome of children treated by the CTC approach in the SNNPR exceeded the minimum standard for both cure and death rates although the average weight gain was low and the average length of stay was longer. The latter may be due to sharing of RUTF with siblings within the family as patients in CTC are treated at home. Our results are similar to the findings in study done in Badewacho in Hadiya in SNNPR, which reported a cure rate of 85% and death rate of 4%, mean weight gain of 4.8 g/kg/day with a mean length of stay of 42 days among 170 children treated in CTC (16). The results of our study were better compared to findings reported from other parts of Ethiopia (Amhara, Oromia) and other African countries (Sudan, Malawi, and Niger) (13,17). The average length of stay was also shorter than results in other parts of Ethiopia, which reported 36-91 days with a similar average weight gain from studies in other parts of Ethiopia (3-6.5 g/kg/d) but less than those reported from other parts of Africa (4.2-10g/kg/day). (13, 17)

The cure and death rates of patients treated in CTC was comparable with those treated in TFC in SNNPR during a similar period. However, the duration of stay was shorter and the mean weight gain was much better for patients treated in TFC than those treated in CTC program. This could be due to the unavoidable sharing of RUTF with siblings and even adults where the bulk of the treatment period in CTC approach is based at home. The fact that most of the data from TFC were collected during emergency and data from the CTC were collected during non-emergency situation makes comparison difficult. However, according to reports (data not shown) from Boricha district from where data from TFC and CTC programs were collected during emergency situations in 2003 and 2005, the treatment outcome was similar confirming that CTC program was effective even during emergency situation.

It was observed that inpatient treatment schemes had no additional advantage over CTC except the higher average weight gain obtained compared to the workload it incurs to health workers and the difficulty to admit all patients with the limited space and health professionals available in the health facilities.

the same period with cure rate of 91% vs. 87% ($p>0.05$) and death rates of 2.5% vs. 3.6% ($p>0.05$), respectively. vs. 5.3 and 5.8 g/kg/day for patients treated in TFC than in CTC ($p<0.01$ for both) (Table 3). A similar trend was observed when the outcome from the CTC program was compared to the sphere standard as shown in Table 4.

The limitation of this study was the fact that it was based on a retrospective record review and there was no information on the follow up of individual cases and suffers incompleteness and missing data.

In conclusion CTC as a new strategy for management of severe malnutrition was successfully implemented in SNNPR. It has a high coverage, low cost and could be expanded very quickly in emergency situations. The majority of patients can be treated in the outpatient program without disrupting caregivers from their daily activities and only very few patients who had infections and very severe malnutrition required inpatient care for few days. The product used in CTC was ready to use therapeutic food (plumpy nut, BP 100 biscuit) and could be implemented as an outreach and by Health Extension Workers.

CTC is an alternative approach for management of severe malnutrition where shortage of health professionals and limited space for admission are the major hurdles. However, problems including shortage of health professionals, drugs, therapeutic products, transportation, lack of space to admit complicated cases, misunderstanding among some who consider CTC as an NGO business, lack of training and high turnover of health workers should be anticipated during integration of CTC into the routine health system. As CTC is a community based approach, deployment of health extension workers in the region in the recent years would be a good opportunity for outreach activities including follow up and referral of cases in the villages.

For the CTC to be taken, scaled up and to be part of the routine service, continuous in-service training of health professionals, inclusion of CTC to the pre-service training, facilitation of transportation of materials required for CTC, local production of therapeutic food and integration of CTC into the routine health service is recommended. The program should be supported with proper nutrition behavioral change communication on infant and young children feeding so that to prevent malnutrition and its recurrence.

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Table 1: Outcome of cases of severe acute malnutrition treated in the CTC program from 2003-2005, South Ethiopia

Zone	Woredas	Number of cases Admitted	Treatment Outcomes				
			Cured		Death		Total Discharged
			N	Percent	N	Percent	
Silte	Dalocha	762	631	92.79	19	2.8	680
	Lanfuro	907	795	88.24	21	2.3	901
Sidama	Malgano	1159	815	80.61	14	1.4	1011
	Boricha	1255	1140	98.96	16	1.4	1152
	Arbegona	248	215	93.48	1	0.4	230
	Bensa	213	61	89.71	2	2.9	68
	Bedessa	399	206	86.92	20	8.4	237
	Shebedino	575	495	95.56	7	1.4	518
	Awssa Zu.	748	479	89.53	11	2.1	535
Wolaita	Boloso Sore	2593	2408	93.12	43	1.7	2586
	Offa	801	641	86.50	20	2.7	741
	Damot Gale	578	514	98.66	4	0.8	521
	Humbo	159	142	95.30	5	3.4	149
	Sodo Zurria	278	185	89.37	9	4.3	207
Kembata T.	Modulla	313	141	86.50	6	3.7	163
Konso	Karat	1328	1003	88.60	19	1.7	1132
	Total	12316	9871	90.9	217	2.5	10831

CTC = Community based Therapeutic care, N = Number

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Table 2: Mean length of stay and average weight gain for cases of severe acute malnutrition admitted to the Community based Therapeutic care program from 2003 to 2005, South Ethiopia.

Centers	Average length of stay in days		Average weight gain in gram/kg/day	
	Marsmus	Kwashiorkor	Marasmus	Kwashiorkor
Dalocha	63	47	5.2	4.0
Lanfuro	61	40	5.6	5.1
Malgano	37	32	7.8	10.0
Shebedino	40	32	4.6	5.0
Awassa Zu.	59	47	3.0	2.8
Arbegona	58	50	5.2	4.4
Boricha	45	32	6.0	5.5
Bedessa	70	66	3.0	18.0
Offa	62	52	3.9	3.1
Sodo Zur.	40	42	7.5	4.8
Boloso So.	58	52	5.0	4.2
Damot Ga.	36	33	5.4	4.4
Humbo	41	30	5.5	3.8
Modulla	32	30	5.3	6.3
Karat	39	37	6.0	5.6
Regional average	49.4	41.5	5.3	5.8

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Table 3: Comparison of outcome of patients treated in TFC and CTC

Program	Cure rate	Death rate	Average length of stay (day)		Average weight gain (g/kg/d)	
			Marasmus	Kwashiorkor	Marasmus	Kwashiorkor
TFC	87.2	3.6	25	21	14	13.4
CTC	91	2.5	49	42	5.3	5.8

in the southern region treated during similar period (2003-2005)

CTC = Community based Therapeutic care, TFC = Therapeutic Feeding Centre

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Table 4: Outcome of children treated by the Community based Therapeutic care e program from 2003- 2005 compared to the minimum sphere standard, South Ethiopia.

Indicator	Sphere standard*	Our Study findings
Cure rate	>75%	90.9%
Death rate	<10%	2.5%
Mean weight gain	>8grams/kg/day	5.34-5.8 gram/ kg/ day
Mean duration of stay	30-40 days	42-49 days

*Guideline for management of severe acute malnutrition,FMOH,2007, Referrence.22

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