

Original Research Article

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Impact of effective counselling on management of moderate acute malnutrition in a community

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ABSTRACT

Background: Moderate Acute Malnutrition (MAM) is defined as Weight for Height between -2SD to -3SD, and/or Mid Upper Arm Circumference (MUAC) 11.5 cm to 12.5 cm. Effect of not treating MAM has a significant impact on Severe Acute Malnutrition (SAM) burden. Management of MAM is possible through supplementary feeding or Community centre counselling.

Methods: Present study was a prospective case control study done in 2013-14 in 200 children in adjacent communities. Community in which intervention (dietary counselling) was planned, it was labelled as case group. For dietary counselling 'structured group counselling' method was selected in which at a time parents of six MAM children were involved. Counselling was done by a trained counsellor using all techniques proposed by IYCF. Counselling sessions were scheduled at 0, 1, 3 and 6 months.

Results: 60% children of case group moved to improved or well-nourished nutritional status (p-value 0.00001). Amongst improved group, weight for height improvement is statistically significant (p-value 0.001), average weight attained is 2-3 kg in 6 months with average weight gain of 1.5-3 grams/kg/day. MUAC improvement was also found to be statistically significant (p-value 0.003), there was 47% improvement in case group with average MUAC gain is 0.6 cm to 1 cm in 6 months (0.13 cm/month). Also, there is early rise in weight for height than MUAC. Average duration to achieve target weight for height is 4.3 months in case group as compare to 5.3 months in control group.

Conclusions: Structured and integrated group counselling using all counselling skills by a trained counsellor should be an integral part of managing MAM in community. Weight for height should be primary indicator in early phase of response as compare to MUAC in measuring impact of counselling.

Keywords: Counselling, Mid upper arm circumference, Moderate acute malnutrition, Weight for height

INTRODUCTION

Moderate Acute Malnutrition (MAM), is defined as weight-for-height between -2SD to -3SD of WHO child growth standards and/or MUAC \geq 11.5 cm and $<$ 12.5 cm and no edema. According to the World Health Statistics report, a global total of 52 million children under 5 could be classified as having acute malnutrition in 2012, of which 33 million had MAM (defined as Weight-for-Height (WFH) between -3 to -2 Standard Deviations).¹ The majority of the countries have a prevalence of MAM

greater than 10%. South Sudan tops the list with a prevalence of 23%, while Indonesia has a prevalence of 13%. In absolute numbers however, India has the highest burden, with over 25 million children under 5 with MAM or SAM.² According to UNICEF/WHO prevalence of MAM in India is 20% and SAM is 6%.²

The prevalence of malnutrition varies across states; with Madhya Pradesh recording the highest rate (55 per cent).³ The NFHS (2006) put the number of malnourished children in this central Indian state (Madhya Pradesh) at a

whopping 6 million which is over 60 per cent of its total number of children under 5 years of age. Out of these 6 million malnourished children, 1.3 million have Severe Acute Malnutrition (SAM) and another 1 million have Moderate Acute Malnutrition (MAM).⁴

Although severely malnourished children have a much higher risk of dying than mildly or moderately malnourished ones, but their total impact is larger and the majority of deaths (76-89%) are linked to them because of their larger burden in the community.⁵ MAM does not pose as high a risk to life as SAM, the impact of not treating MAM on child survival is still significant. Moreover, every child with severe acute malnutrition at one time suffered from moderate acute malnutrition.

Progress in the treatment of Moderate Acute Malnutrition (MAM) has not gathered the same momentum as that of SAM management. SAM children are easily being picked up by physical characteristics while MAM children are not, so they remain as silent as a base of iceberg which continuously keeps on turning into SAM. SAM children are aggressively managed for their medical complication, while there are still gaps in understanding the management of MAM. Supplementary feeding in managing MAM however, is always not been effective, with noting high rates of defaulting, low coverage, high associated costs and high drop-out rates.

The better option could be counselling which make permanent behavior change among caregiver of children and remains the most important modality of treating MAM. This approach focuses on disseminating information on appropriate feeding practices which can increase dietary diversity and meet nutritional requirements, as well as improvements in sanitation and hygiene practices.⁶ keeping these facts in mind this study was conducted to assess the impact of Counselling in MAM at community level.

METHODS

Study population

For this non-randomized trial two adjacent communities located on outskirts of city of Gwalior, Madhya Pradesh, India were selected. To define Moderate Acute Malnutrition (MAM) standard definition given by world health organization was used. A door to door survey was done to pick up cases of MAM in both the communities.

Inclusion criteria

- Child of age between 6 months to 5 years, with Mid upper arm circumference between 11.5 cm to 12.5 cm and/or weight for height between -2SD to -3SD of WHO growth standards
- Only one child of MAM was selected from each household.

- Only children whose parents gave consent were enrolled for the study.

Exclusion criteria

- Child with associated significant systemic disease like Tuberculosis, HIV, kidney disease, heart disease, cerebral palsy etc.
- Child not enrolled in anganwadi for supplementary feeding program.
- Children Migrated to other cities in follow up.

This survey continued till 200 children of MAM in the age group 6 months to 5 years were enrolled from each community. Ethical approval for this study was obtained from Institutional Ethical Committee of hospital.

All enrolled children were examined thoroughly and relevant baseline characteristics and causative risk factors (anthropometric measurements, dietary history regarding breast feeding, complementary feeding, amount, consistency, method of feeding, calorie gap, parental education, immunization, sanitation by Briscoe sanitation scale, microenvironment score) were taken.

Community in which intervention (dietary counseling) was planned, it was labeled as case group. For dietary counseling 'structured and integrated group counseling' method was selected in which at a time parents of six MAM children were involved. Counseling was done by a trained counselor using all techniques proposed by IYCF. Counseling sessions were scheduled at 0, 1, 3 and 6 months. At each counseling weight for height and MUAC were also measured. Second community in which no dietary counseling was provided, it was labeled as control group. These children were also followed at 0, 1, 3 and 6 months for measurement of weight, height and MUAC.

Proportion of children achieving desired target (weight for height >1 SD and MUAC >12.5 cm) in both the groups was our primary outcome. Secondary outcomes were time to achieve desired target and rate of weight gain. Statistical analysis was done using SPSS 20 software and Microsoft Excel. p value <0.05 was taken as significant.

RESULTS

This study was done in 200 children with MAM in case group as well 200 children in control group. At starting of study various baseline parameter and anthropometric measurements are taken which are comparable in both case group and control group (Table 1).

There is statistically significant improvement in the nutritional status of case group following structured group counselling as 60% children of case group moved to improved or well-nourished nutritional status (p-value 0.00001) (Table 2) (Figure 1).

Amongst improved group weight for height improvement is statistically significant (p-value 0.001) (Table 4),

average weight attained is 2-3 kg in 6 months with average weight gain of 1.5-3 grams/kg/day.

Table 1: Distribution of baseline parameters, anthropometric variables and causative risk factors of MAM.

| | | Case n=200 (group I) | Control n=200 (group II) |
|-------------------------------------|-----------------------------------|----------------------|--------------------------|
| Age group | 6 Months -1 Year | 41 | 50 |
| | 1 Year-2 Year | 95 | 84 |
| | 2 Year-5 Year | 64 | 66 |
| Sex | Male | 111 | 118 |
| | Female | 89 | 82 |
| Anthropometric variables | MUAC 11.5 to12.5 | 154 | 149 |
| | MUAC >12.5 | 46 | 51 |
| | Weight for height-2SD TO-3SD | 144 | 132 |
| | Both | 89 | 81 |
| | Weight for height-1SD TO -2SD | 56 | 68 |
| Breast feeding | Optimal | 138 | 141 |
| | Not optimal | 62 | 59 |
| Initiation of complementary feeding | 6 Month | 25 | 37 |
| | 7-9 Month | 113 | 104 |
| | >9 Month | 62 | 59 |
| Parental education | | | |
| Maternal education | Illiterate | 106 | 108 |
| | <10 th Class | 63 | 67 |
| | >10 th Class | 31 | 25 |
| Paternal education | Illiterate | 88 | 97 |
| | <10 th Class | 61 | 48 |
| | >10 th Class | 51 | 55 |
| Feeding methods | Faulty feeding methods | 171 | 159 |
| | Optimal feeding methods | 29 | 41 |
| Amount (by dietary recall) | Adequate | 83 | 91 |
| | Inadequate | 117 | 109 |
| calorie intake of RDA | <50% | 44 | 52 |
| | 50%-75% | 132 | 124 |
| | >75% | 24 | 24 |
| Immunization | Fully immunized | 78 | 74 |
| | Partial but primary immunized | 56 | 63 |
| | Partial and not primary immunized | 34 | 40 |
| | Unimmunized | 32 | 23 |
| Briscoe sanitation score | Good | 19 | 20 |
| | Fair | 132 | 143 |
| | Poor | 49 | 37 |
| Microenvironment score | Good | 18 | 17 |
| | Fair | 100 | 112 |
| | Poor | 82 | 71 |

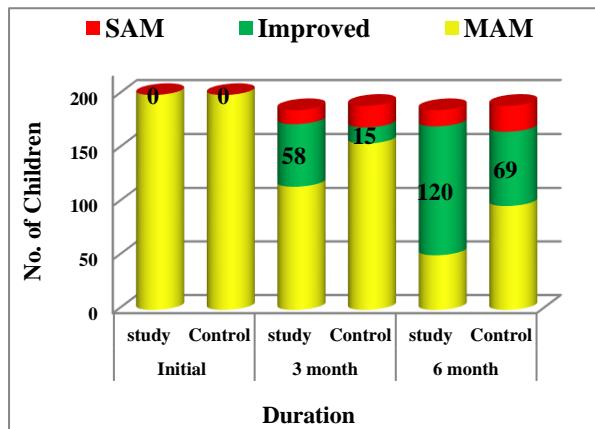
Table 2: Distribution of change in nutrition status between case and control.

| | Case n=200 (group I) | | | Control n=200 (group II) | | |
|---|----------------------|---------|---------|--------------------------|---------|---------|
| | Initial | 3 Month | 6 Month | Initial | 3 Month | 6 Month |
| MAM | 200 | 115 | 51 | 200 | 155 | 97 |
| Improved | 0 | 58 | 120 | 0 | 15 | 69 |
| Chi square = 27.99; DF=1; p-value = 0.00001 | | | | | | |

Table 3: Distribution of decrease in nutritional status between case and control.

| | Case n=200 (group I) | | | Control n=200 (group II) | | |
|---|----------------------|---------|---------|--------------------------|---------|---------|
| | Initial | 3 Month | 6 Month | Initial | 3 Month | 6 Month |
| SAM | 0 | 13 | 15 | 0 | 20 | 24 |
| Drop out | 0 | 14 | 14 | 0 | 10 | 10 |
| Chi square = 2.36; DF=1; p-value = 0.12 | | | | | | |

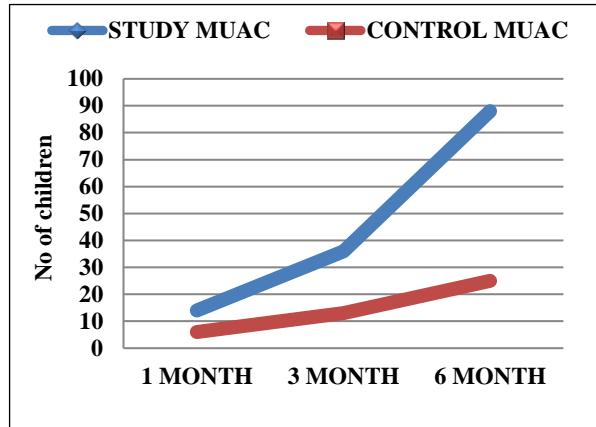
MUAC improvement which is also significant (p-value-0.003) (Table 4) is 47% improvement in case group at end of study period with average MUAC gain is 0.6 cm to 1 cm in 6 months (0.13 cm/ month).

**Figure 1: Change in nutritional status following counselling in study group and control group.****Table 4: Distribution of change in MUAC and change in weight for height among case and control.**

| MUAC in cm | Cases (n=186) | | Control (n=190) | | p-value |
|--------------------------------|---------------|-----------|-----------------|-----------|---------|
| | Initial | End point | Initial | Endpoint | |
| <11.5 | 00 | 10 | 00 | 17 | |
| 11.5 to 12.5 | 141 | 43 | 151 | 99 | |
| >12.5 | 45 | 133 | 49 | 74 | |
| At end point of study | | | | | |
| Improvement MUAC>12.5 | 88 | | 25 | | |
| Chi square = 12.68; p = 0.0003 | | | | | |
| Weight for height | Cases (n=186) | | Control (n=190) | | p-value |
| | Initial | End point | Initial | End point | |
| -1SD to -2SD | 49 | 14 | 61 | 11 | 0.3 |
| -2SD to -3SD | 137 | 37 | 129 | 86 | 0.0007 |
| >-1SD | 00 | 120 | 00 | 69 | 0.001 |
| <-3SD | 00 | 15 | 00 | 24 | 0.003 |

Also, there is early rise in weight for height then MUAC which is also statistically significant (p-value-0.0012) Average duration to achieve target weight for height is 4.3

months in case as compare to 5.3 months in control group which is statistically significant (Table 5) (Figure 2, 3).

**Figure 2: Average duration to achieve target MUAC.****Table 5: Distribution of average duration/time to reach at target MUAC and weight for height.**

| Average duration in months | No of cases whose MUAC >12.5 | No. of controls whose MUAC >12.5 |
|----------------------------|---|---|
| 1 month | 14 14(15.9%) | 06 06(24%) |
| 3 months | 36 22(25%) | 13 07(28%) |
| 6 months | 88 52(59.1%) | 25 12(48%) |
| Chi-square | | 0.78 |
| Df | | 2 |
| p-value | | 0.67 |
| Average duration in months | No of cases whose weight for height >-1sd | No. of controls whose weight for height >-1sd |
| 1 month | 07 07(5.8%) | 02 02(2.89%) |
| 3 months | 58 51(42.5%) | 15 13(18.8%) |
| 6 months | 120 62(51.6%) | 69 54(78.3%) |
| Chi-square | | 12.17 |
| Df | | 2 |
| p-value | | 0.002 |

DISCUSSION

According to Cochrane review 20137 Provision of foods following standard care or simple counselling improve a number of key outcomes in children with Moderate Acute Malnutrition.

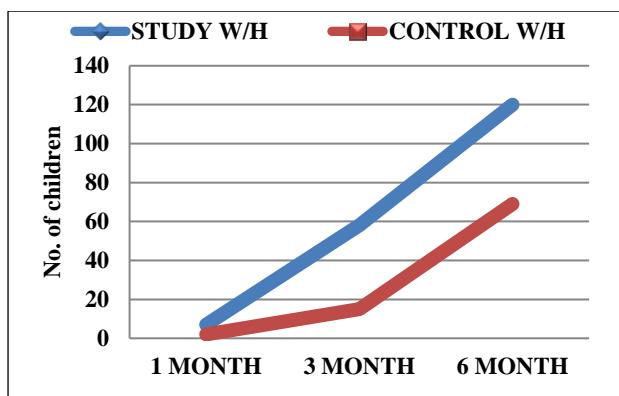


Figure 3: Average duration to achieve target weight for height.

In a study done by Komal P Kushwah et al, at Lalitpur district of UP, India between 2006 to 2011, feeding practices were assessed before creating Mother Support Group (MSG), and reassessed at two points-2 (T1) and 5 years (T2) after counselling given by MSG for improving IYCF practices, and it was concluded that peer counselling by MSG's improved IYCF practices and the effect could be sustained.⁷

In another study done by Bhandari et al, AIIMS, new delhi, a healthcare worker trained in health and nutrition provided counselling in communities for mother at multiple opportunities and found out promotion of exclusive breast feeding is feasible through counselling and promote growth of babies.⁸

Similar results were also seen in Bangladesh in a study done by Haider et al, that peer counsellor can effectively increase the initiation and duration of EBF.⁹

In this study there is significant improvement in studied group following counselling as more than 60% children moved into well-nourished nutritional status, with average weight gain is 1.5-3 grams/kg/day. Reason of significant improvement could be due to structured, clear and prescriptive counselling done by trained counselor using all IYCF counselling skills. Other studies lacking improvement are mostly due to lack of clear and informative options to mother or caregiver of children.

Peru study of Fernandez Concha et al, - in which 54 subjects were taken, most of which are moderately underweight.¹⁰ Dietary counselling was done by a physician first at home then subsequently on clinic, giving seven clear messages. After 3 months 50% of children had moved to mild/well-nourished category.

Bangladesh study of Roy et al, specifically targeted moderate underweight children (weight for age 61-75% NCHS), Mothers of these 292 children were randomly allocated in to 3 groups(i) one group received nutrition education twice weekly for 3 months and the second group received nutrition education plus food supplement

of 300 kcal and 8-9 grams protein/day.¹¹ Control group received standard nutrition services with no supplementary food. Results of this study was statistically significant, but rate of recovery was slow (1-2 grams/kg/day) and there is around 40% children moved to mild or well-nourished category. In his second study, an intensive education regimen was compared with less frequent education. Both groups gained at 1.3 kg during 6 month's intervention, giving a rate of weight gain of 1 gram/kg/day and approximately 40% of children moved to mild/well-nourished category by end of 6 months.

Another study of Bangladesh by Ahmed et al, compared domiciliary care by home visit, clinic visit and inpatient care of severely acute malnutrition children with promotion of home feeding and provided micronutrient.¹² Results of following study shows rapid weight gain (10 gm/kg/day) in home based rehabilitation with micronutrients. This study explains its higher weight gain by the facts as severe malnourished cases are taken into account as well micronutrients supplements were given.

Study conducted at Jamaica by Bredow et al, highly prescriptive advice was provided to by health aides to mother of malnourished children at a clinic.¹³ Malnourished children (n=25, Gomez grade I and II) with the mean weight for age of 68% to 77% over 5-6 months, equivalent to weight gain of 1.4 grams/ kg/day. Most of them were moderately stunted as well wasted.

Bangladesh study of Khanam et al, implemented at children's nutrition unit Dhaka , treatment at home with family food was introduced and cost-effectiveness trial was undertaken to compare inpatient care with domiciliary care group which results suggest slow weight gain then other group with 1/5th cost of inpatient care.^{14,15} The rate of weight gain during the period approximating "moderate malnutrition" averaged 4-5 grams/kg/day.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee of GR medical college, Gwalior, Madhya Pradesh, India

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