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Research Article

Experience in managing children with severe acute malnutrition in nutrition rehabilitation centre of tertiary level facility, Delhi, India

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ABSTRACT

Background: As per NFHS-3 approximately 8.1 million children under the age of 5 years (6.4%) suffer from severe acute malnutrition (SAM). To assess the potential of addressing SAM with complications effectively at a Tertiary level Hospital following facility based guidelines of Government of India (GOI) for Severe Acute Malnutrition and to analyse the co-morbidities associated in these children.
Methods: This study was carried out in nutrition rehabilitation centre (NRC) of Hindu Rao Hospital (HRH), New Delhi India. For this review of data of SAM Children who were transferred to NRC & who stayed for 7 days or more in the hospital during 1st August 2012 to 30th November 2014 was done. Intervention involved detection and treatment of SAM children adopting GOI, 2011 guidelines. Assessment & interpretation of survival, co-morbidities and recovery rates was done.
Results: After screening of 5295 (2-59 months) children admitted during above mentioned period, 906 (17.1%) were found to be having associated SAM. Out of 906 SAM patients 473 (app 52%) were shifted to NRC after initial stabilization. Children who stayed for 7 days or more were 327 (69.1% of transferred cases), their data was analysed. Of these 47.8% (n-156) children had diarrhoea/dysentery as the presenting complaint and 37.5 % (n-122) had pneumonia or other respiratory infections. Other Co-morbidities were severe anaemia, tuberculosis, meningitis, UTI, etc. Urine culture was positive in 17% cases (n-19 out of 112 cases in which urine culture could be sent). There were 88 % (n-272) anaemic children, 42.5 % (n-141) were having moderate anaemia (7-9.9 gm/dl) and 20.1% (n-65) were having severe anaemia (< 7.0 gm/dl). Packed cell transfusion was given to 9.6% (n-31) children. X-ray wrist was suggestive of Rickets in 39.2% (n-121) cases. Two children were positive for HIV. App 76% children had moderate (5-9.9 gm/kg/day) to good weight gain (10 gm/kg/day or more). Children more than 24 months old had significantly higher weight gain (41% vs. 34%). 39% Male children had good weight gain as compared to 32 % in females. Average weight gain of the NRC was 8.5 gm/kg/day. Only 18.2% children were registered under Aanganwadi. For 38.7% Nutritional status was not their priority even after repeated counselling and they preferred to leave early. Other reasons were like commitment for other family members (34.3%), siblings (24.4%) and job of mother (2.5%). Mortality was only 1.8 % (17 out of 906) of all admitted SAM children during this period, and no mortality in NRC ward.
Conclusions: It is practical and effective to manage complicated SAM as per GOI guidelines, in a hospital setting with NRC attached with pediatrics department.

Keywords: NRC, SAM, Severe wasting, Co-morbidities, Urinary Tract Infection, Anaemia, MUAC, WHZ

INTRODUCTION

As per NFHS-3 approximately 8.1 million children under the age of 5 years (6.4%) suffer from SAM.[1]

Although children are usually taken to a healthcare facility for acute illnesses, severe malnutrition is often an underlying factor which contributes to high mortality and morbidity. These children with associated SAM, due to

reductive adaptation need a different protocol of management from the time child is admitted in facility. The main objective of this study was to provide evidence based results, that management of children of SAM with complications using standard GOI guidelines is practically possible & equally effective.

METHODS

All the children admitted were screened for SAM. Next day two dedicated nursing staff did anthropometry to confirm and ensure that no child is missed out. Children 2-59 months of age were diagnosed as having SAM as per WHO growth standards i.e. WHZ score < - 3 SD and/or MUAC of <115 mm (in age > 6 months), and/or bilateral pitting pedal edema (after excluding other causes of edema).[2] Children after initial stabilization in pediatric ward were shifted to NRC if there was bed vacant in NRC to provide more focused care .Willingness of the parents to stay for a longer period and availability of beds in the NRC were other main criteria's.

Management protocol

SAM cases were managed in two phases (a) stabilization phase and (b) rehabilitation phase and in between transition phase as per GOI guidelines based on training course on management of severe malnutrition, WHO 2009 and IAP guidelines 2006 on hospital based management of severe acute malnutrition.[3] The initial treatment in the stabilization phase started with admission to the hospital and lasted until the child's condition stabilized and appetite returned, which usually took 3-7 days. Child was shifted to NRC after initial stabilization, Rehabilitation phase started in second week of admission & included catch up growth, providing structural play therapy & preparing for discharge & follow up. All children received antibiotics as per guidelines & medical illness along with therapeutic feeds & micronutrients.[4]

After treating infection iron was added, generally by 7th - 10th day. The children were discharged after their medical complication is taken care of, gaining weight at least 5 gm/kg/day for 3 days, received supplements for at least 14 days and have gained 15% weight from the admission weight and mother or caregiver has been trained to feed appropriately as per IYCF guidelines and to take care of the child at home. Children stayed in NRC as per their individual need; there was no fixed duration of stay.

Statistical method used

1. WHO Anthropometry software (version 3.2.2)
2. Data were kept in the Epi- Info software (version 3.5.3).

RESULTS

During study period 906 out of 5295 children (17.1%) were found to have associated SAM and out of these 473 were shifted to NRC (appox 52%) after initial stabilization. The management of these children including therapeutic diet was started as per GOI guidelines from the emergency ward /Paediatrics ward. Data of the children who were shifted and stayed for 7 days or more (Including the period of stay in ward) i.e. 327 (69.1%) were analysed.[4] There were 79.8% children below 24 months of age and 49.5% were males. Data showed 56% (n-182) were classified as SAM by both indicators i.e. WHZ <-3 SD and MUAC <115 mm, where as 33 % (n-108) were diagnosed on the basis of MUAC <115 mm only and 11% (n-37) only had WHZ <-3 SD, There was only one case out of these cases of oedematous malnutrition.

All these children had come to hospital with some medical illness, 47.8% (n-156) had diarrhoea/ dysentery as one of the chief complaint & 37.5% (n-122) had pneumonia or other respiratory infection. Other Co-morbidities were severe anaemia, meningitis, UTI, tuberculosis etc. Urine culture was sent for 112 children irrespective of presence or absence of symptoms of UTI and was positive in 17% cases (n-19). In more than 85% organism was *E. coli* and *Klebsiella.*

Complete blood counts were done in all children, 88 % (n-272) were anaemic; 42.5% (n-141) were having moderate anaemia and 20.1% (n-65) had severe Anaemia as per WHO classification.[5] Packed cell transfusion was given to 9.6% (n-31) of children. X-ray wrist was done for 308 (94.2%) children & showed Rickets in 39.2% (n-121). HIV was positive in only two cases.

Weight gain was analysed for children in different groups and results are shown in the Table 1 & Table 2.

Table 1: Weight gains in children.

	Total no of patient	Weight gain 5 -9.9 gm/kg/day	Weight gain 10 gm/kg/day and more
SAM children by any criteria	327	135 (41%)	115 (35%)
SAM by both (56%)	182	77(42%)	72(40%)
SAM by MUAC (33%)	108	47 (44%)	29 (27%)
SAM by WHZ SCORE (11%)	37	11 (30%)	14 (38%)

Approx 76% children had moderate to good weight gain. Children more than 24 months had significantly higher weight gain/ kg/day. In female children good weight gain (10 gm/kg/day or more) was in 32% in comparison to 39% male children. Average weight gain of NRC was 8.5 gm/kg/day.

As very sick children were kept in the ward only therefore mortality rate was considered for all admissions

of SAM during above period i.e. 906 children, overall mortality was 1.87% (None in NRC) which is acceptable as per WHO standards.[6]

Table 2: Weight gains in different age groups.

Weight gain	Age <24 months		Age >24 months	
Total No	261		66	
5 -9.9 gm /kg/day (moderate weight gain)	112 (43%)		23 (35%)	
10 gm/kg/day and more (good weight gain)	88 (34%)		27 (41%)	
	Male- 49 (55.7%)	Female- 39 (44.3%)	Male- 14 (51.9%)	Female- 13 (49.1%)

Only 18.2% of these children were attached to an Aanganwadi. Reason for leaving early (absconded, LAMA or DOR without cure) was also analysed and in 38.7% who left early, parents were not concerned about nutritional status of the child even after repeated counselling, 34.3% due to commitment for other family members including functions in the family. Care and education of other Sibling was also an important issue in app 24.4%, though younger siblings were allowed to stay in the NRC. Job of mother was a concern in only 2.5% of cases.

DISCUSSION

Out of all the patients diagnosed with SAM ,56 % in the age group 6-59 months fitted in both criteria for SAM i.e. WHZ <-3 SD and MUAC <115 mm. Out of all the patients diagnosed with SAM, 56% in the age group 6-59 months fitted in both criteria for SAM i.e. WHZ <-3 SD and MUAC <115 mm. According to Guidelines Update on Management of SAM in infants and Children 2013 by WHO about 40% of children are classified as having severe acute malnutrition using both criteria and in the research paper published in Indian Paediatrics on Management of Children with SAM: Experience of NRC in Uttar Pradesh, India the results showed that 70.7% had both a WHZ below -3SD and a MUAC <115 mm.[7,8]

All the cases admitted were medically complicated SAM and Diarrhoea and Respiratory infections were the major co-morbidities. In app 85.3% cases (n- 279) either of these alone or with other co-morbidity was the reason to attend OPD or emergency. This experience is similar to other Indian and international studies. 54% SAM children had diarrhoea and 27.9% of children suffered respiratory infection in study from Gandhi Memorial Hospital, Rewa, MP and studies from Africa have also shown high incidence of diarrhoea, 49% and 67% in different studies.[9-11]

The UTI has come out to be one of the major co-morbidity, with positive culture in 22%; *E. coli* was causative agent in more than 90 % cases. Wide variation has been reported in the incidence of UTI in different studies. In a study on "Infections in Children Admitted with Complicated SAM in Niger" out of 300 children tested, a UTI was detected in 48 (16%). *E. coli* represented more than three quarters (n= 37/48) of the microorganisms isolated.[12] On the contrary, very low incidence has been reported by R. Kumar et al in Rewa study only 1 %.[9] In Review article on SAM and infection by Kelsey D. J. Jones, James A. Berkley in different studies UTI has been reported to range from 11% to 42 %.[13] Most of the studies reviewed for this are conducted amongst sick SAM children treated in inpatient facilities at tertiary centres. Such a high incidence emphasizes that all SAM cases should be investigated for UTI irrespective of signs and symptoms.

As per NFHS-3 70%, in age group, 6-59 months are anaemic in India with 3% of children of age 6-59 months are severely anaemic, 40% moderately anaemic, and 26% mildly anaemic irrespective of their nutritional status.[1] Prevalence of Severe Anaemia is of particular concern because of its close relationship to children's health and mortality. In the present study 88% (n-272) children were found to be anaemic and as per WHO classifications of Anaemia 20.1% (n-65) were cases of severe Anaemia, 42.5% (n-141) were having moderate anaemia and 20.4% (n-66) were cases of mild anaemia. Packed cell transfusion was given to 9.6% (n-31) children. Severe anaemia has been reported as 24 % in study from Rewa, MP on Co-morbidities in Hospitalized Children with SAM.[9] In this study 11.5% children had normal haemoglobin level, 7.6% mild anaemia, 55.7% had moderate anaemia, though in another study from Lady Harding Medical College severe anaemia has been reported to be 67.3% and of them 25 % were needed to be given transfusion out of total 131 cases.[14] In children of medically complicated cases of SAM, Severe anaemia though wide range (20-68%) reported in different studies is real concern and challenge in management of complicated SAM.

One of the other most common vitamin deficiencies in these children was Rickets in 39.2%, (121 out of 308). In study from Rewa, it is reported to be 15.2%.[9] These high figures indicate the need of screening all children for rickets.

For a child as per guidelines ≥5 gm/kg/day is considered moderate weight gain and ≥10 gm/kg/day as good weight gain. 76.5% (n=250) children had moderate (41%) to good weight gain (35%). Experience of NRC in UP has shown that 37.5% children had good weight in children (58.2% uncomplicated cases).[9] Study from Hyderabad using energy rich dense food shows good weight gain could be achieved in only 12% of cases and more than 52% either had poor weight gain including 8% not gaining weight at all.[15] It was also observed in our study,

SAM children by both (WHZ & MUAC) parameters had much better weight gains Out of them 82 % had moderate to good weight gain in comparison to children who were SAM by WHZ Score only, 68%. This needs further studies with a larger number of children. Weight gains in different age groups was also compared in less 24 months of age vs. more than 24 months of age, and it was found that above 24 months age group had more children gaining 10 gm/kg/day 41% vs. 34%.

Average weight gain of this NRC was 8.5 gm/kg/day, which is good as per standards of GOI guidelines (more than 8.0 gm/kg/day are considered good).[6]

Important issue in these children is long hospital stay. High number of parents want to leave the hospital as soon as acute problem is solved due to responsibilities of siblings and other family members and significantly high (38.8% of who left early) do not realize the significance of Malnutrition even after counselling for their child. In Delhi very low percentage (18.0%) was attached to Aanganwadi, their services need to be better utilized.

CONCLUSION

It is practical and effective to manage complicated SAM as per GOI guidelines, in a hospital setting with NRC attached with paediatrics department.

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