



**ORIGINAL RESEARCH PAPER**

**Paediatrics**

**THE ROLE OF FEEDING PRACTICES AS RISK FACTORS IN CHILDREN FOR SEVERE ACUTE MALNUTRITION AND MODERATE ACUTE MALNUTRITION IN CENTRAL INDIA**

**KEY WORDS:** feeding practices, Severe Acute Malnutrition, Moderate Acute Malnutrition

**Dr Garima Agrawal Varshney\***

MD Pediatrics, Assistant professor, department of Pediatrics , Sri Aurobindo institute of medical sciences, Indore \*Corresponding Author

**Dr Ajit Solanki**

(MD paediatrics, consultant pediatrician at shree sai baba jeevandhara hospital, barwani, MP)

**ABSTRACT**

**Background:** Severe acute malnutrition (SAM) is emerging as a silent threat to global development. Improper feeding practices along with lack of knowledge regarding nutritional requirements of child are an important risk factor for SAM. Aim of the study was to identify various feeding practices in hospitalised undernourished children.

**Methods:** All hospitalised children between age 6m to 3 years who fulfil the inclusion criteria. Data was recorded and analysed.

**Results** Initiation of BF after 24hrs of birth, not practicing exclusive breast feeding , total duration of breast feeding given to the child < 12 months, giving top milk in initial 6m of life , dilution of top milk , practice of bottle feeding , initiation of complementary feed after 9m of age , and not breast feeding the child when complementary feeds are started were found to be statistically significant.

**Conclusion:** SAM in children can be prevented with the maternal education and counselling regarding appropriate feeding practices.

**Introduction**

Acute malnutrition and growth retardation are probably the most widespread health and nutritional problems of the developing countries like India. Despite all time high India's economic growth, improving literacy and even declining infant mortality, India continues to harbour high percentage of malnourished children. The national family health survey (NFHS 4)<sup>(1)</sup> data (2015-2016) reports that under 5 years of age 21% of Indian children are wasted (25.8% in Madhya Pradesh). Of these 7.5% are severely wasted (9.2% in MP) and 38.4% were stunted (42% in MP).

Though poverty is the main contributing cause in developing countries, it is important not to underestimate the role of feeding practices in the aetiology, prevalence , incidence and interpretation of malnutrition.

The purpose of this study is to find out the social factors and their role in causing severe acute malnutrition in our setting. In dealing with the problem of malnutrition, certain common myths need to be dispelled, for availability of food items and resources may not always be the problem. However taboos, beliefs , customs and inadequate knowledge under the umbrella of ignorance may be the limiting factors for proper nutrition.

**Aims and objective**

To study various feeding practices as risk factors for severe acute malnutrition and moderate acute malnutrition in children between age 6months to 3years.

**Material and methods**

This was prospective observational cross sectional study conducted in department of paediatrics , Gandhi medical college and associated Hamidia hospital Bhopal, in central India over a period of one year - January 2009 to January 2010. Ethical permission for the study was obtained from the ethical research committee, Gandhi medical college, Bhopal. The subjects were the indoor undernourished children between 6 months to 3 years who were admitted in hospital. They were categorised into severe acute malnutrition(SAM) and moderate acute malnutrition(MAM) . In this study diagnostic criteria of SAM<sup>(2)</sup> was defined by any of the following:

1. Weight for below -3 standard deviation (SD or Z scores) of the median WHO growth reference (2006)
2. Presence of bipedal edema
3. Mid upper arm circumference below 115mm.

Moderate acute malnutrition (MAM) were defined as weight for height >-3 and <2 z score or <80% to >70% percentage of the median (WHO growth reference 2006).

Children in whom some underlying organic cause of under nutrition was found like congenital heart disease, metabolic disease, congenital haemolytic disorders and in whom primary care giver gave negative consent for study or was not available to answer the questionnaire were excluded.

Participation was fully voluntary after taking consent and explaining the purpose of the study .

Data was collected using structured questionnaire which included information on demographic data and details on breastfeeding, nutrition practices and knowledge and beliefs regarding nutrition of the child from the immediate care giver , which were usually the mothers.

Sample size was calculated according to prevalence of SAM in India. Sample of 250 patients (145 SAM, 105 MAM) was statistically sufficient to meet the objective of the present study.

**Clinical assessment**

Thorough clinical examination and assessment of nutrition status by anthropometric assessment was done. The following parameters were recorded on each subject.

**1. Weight**

Children's nude weight was taken using a frequently standardized digital scale with 5g precision (seca, modal- 727).

**2. Length / height**

Length of all infants was recorded by placing them on infant-meter with the help of an assistant taking care to avoid bending of head, legs and foot. The length and height were recorded in centimeter. Height was measured in children who were more than 24 months of age, and were able stand by placing them against a wall with their bare feet touching each other, the heel, calf, buttock, upper back and occiput touching the wall and child looking straight ahead. A firm scale is placed pressed to the head to mark the point indicating the height.

**Statistical analysis**

The data collected was organized, analysed and interpreted. The appropriate SPSS software was used for analysis. The differences in proportions were compared by the chi-square test. A probability of

less than 0.05 was considered statistically significant. The strength of association of selected risk factors for SAM was determined by estimated odds ratios (ORs) and their 95% confidence intervals (Cis).

**Results**

Total of 250 children aged 6m to 3 years were analyzed. Male predominance was seen in both the groups ie 62.1% and 60% among SAM and MAM. There were 90(62.1%) males among the SAM and 63(60%) among the MAM.

**Feeding Practices**

Prelacteal feeds were given in 28.3% of SAM children and 23.8% in MAM children. 24.1% of SAM children could not receive colostrums as compared to 19% in MAM group.

Regarding initiation of breast feeding, only 9.7% of SAM children as compared to 12.4% of MAM group received breast feeding within 30 minutes of birth. 54.4% of total children under study started breast feeding within 234hrs of birth. Only in 11(4.4%) children breast feeding were delayed for more than 48hrs and all these belongs to SAM group.

Practice of exclusive breast feeding was found more among MAM (35.2%) as compared to SAM (22.8%).

Among the studied undernourished children only 70(28%) mothers followed the concept of exclusive breast feeding.

Among SAM group only 2(1.4%) children were exclusively breastfed till 6 months of age, while majority 19(13.1%) were continued on breastfeeding only without starting complementary feeds even after 6 months of age.

Only 56.6% of SAM received breast feeding for more than 12 months as compared to 73.3% MAM children.

More children among SAM 40.7% as compared to 22.9% were given top milk in initial 6months instead of breast feeding. Out of 33.2% children who were top fed 30% were given diluted top milk. Practice of dilution of milk was more among SAM (37.9%) as compared to MAM(19%).

Bottle feeding was seen more among SAM 31(21.3%) as compared to MAM 5 (4.76%) children

In majority of SAM children 86(59.3%) introduction of complementary feeds was delayed for more than 9 months as compared to 42(40%) among MAM.

164(65.6%) of mothers/ caregivers reported that they take care of handwashing with soap and water before preparing food and feeding the child, which was 62.1% among SAM and 70.5% among MAM group respectively.

Majority of mothers /care givers (58.8%) do not practised active feeding. Active feeding was seen more among MAM (45.7%) as compared to SAM (37.9%).

**Frequency distribution according to age**

Age (months)	SAM	MAM
6-12	60(41.4%)	40(38.1%)
13-24	44(30.3%)	47(44.8%)
25-36	41(28.3%)	18(17.1%)

**Feeding practices associated with severe acute malnutrition**

s. no	Attribute	SAM (n=145)		MAM (n=105)		Odds ratio (95%CI)	P value
		No.	%	No.	%		
1	Delayed initiation of BF(after 24hrs of birth)	57	39.4	26	24.8	1.97	0.01*
2	No practice of exclusive breast feeding	112	77.2	68	64.7	1.85 (1.06-3.23)	0.03*

3	Duration of total BF<12 months	60	41.4	28	26.7	2.01 (1.17-3.47)	0.01*
4	Giving top milk in initial 6months of life	59	40.7	24	22.9	2.32 (1.32-4.07)	<0.001*
5	Dilution of milk	55	37.9	20	19	2.6 (1.44 - 4.69)	0.001*
6	Bottle feeding	31	21.3	5	4.76	2.01 (1.17-3.47)	0.01*
7	Late initiation of CF(>9months)	86	59.3	42	40	2.19 (1.37-3.65)	0.002*
8	No BF, along with CF	14	9.7	1	0.95	11.11 (1.44- 85.91)	0.004*

\*significant

Initiation of BF after 24hrs of birth, not practicing exclusive breast feeding, total duration of breast feeds given to the child < 12 months, giving top milk in initial 6m of life, dilution of top milk, practice of bottle feeding, initiation of BF after 9m of age, and not breast feeding the child when complementary feeds are started were found to be statistically significant.

**Discussion:**

SAM is an important preventable and treatable cause of morbidity and mortality in children below 5 years of age in India.

A total of 250 cases between age group of 6 months to three years (145 with SAM and 105 with MAM) were analyzed. Majority of children among SAM 60 (41.4%) were between 6 months to 12 months and 49(30.3%) were between 13months to 24 months, similar to findings of Gangaraj S. et.al<sup>(2)</sup> Mean age of SAM and MAM children were 18.97(+10.19) and 18.44(8.53) months respectively. Choudhary etal<sup>(3)</sup> also reported the same.

After birth prelacteals were given more in SAM children 41(28.3%) as compared to MAM 25(23.8). Solomen etal<sup>(4)</sup> also reported the same. In the present study colostrums was given in 195(78%) children and discarded among 55(22%). Out of 55 children who were deprived of colostrums, 35(24.1%) belong to SAM while 20 (19%) belong to MAM.

In this study less number of SAM mothers 14(9.7%) initiated breast feeding within 30 minutes as compared to MAM 17 (16.2%).

gangaraj S etal<sup>(2)</sup> found that 22.36% started breastfeeding within 1 h of life and 10.5% were completely artificial feed. Gover etal<sup>(5)</sup> also found that 9.1% infants were breastfeed within 1h of birth.

Late initiation of breast feeding (after 24 hrs of birth) is significantly associated with increased risk of SAM. Exclusive breast feeding for 6 months of age was seen in 15% of SAM

Children while Chetterjee and Saha<sup>(6)</sup> found that 26.6% of children attending immunization clinic were exclusive breastfed till 6months of age. Less than 12 months of breast feeding was seen more among SAM(41.4%) as compared to MAM(26.7%). Short duration of breast feeding for children less than 3 years was found by Zhou etal<sup>(7)</sup>.

Bottle feeding was seen more among SAM(21.3%) as compared to MAM(4.76%). Bottle fed children have significantly higher episodes of diarrheal disease RAM etal<sup>(8)</sup> and they have significantly higher risk of stunting than exclusive breastfed, Castillo et al, Chile<sup>(9)</sup>.

In majority of SAM children 86(59.3%) introduction of complementary feeds was delayed for more than 9 months as compared to 42(40%) among MAM. Gangaraj s etal<sup>(2)</sup> reported that 45.7% started complementary feeds at 6-12m and 34.28% after 12 months of age. Active feeding is feeding the child frequently, being alert to hunger cues of child, feeding and encouraging child to eat and feeding the child from separate plate. It was seen more among MAM (45.7%) as compared to SAM

(37.9%).

Our study had certain limitations. Firstly, sample was restricted to tertiary care hospital setting only and majority of patients reporting in our centre belong to lower socioeconomic status. All the data was self reported by response based on recall method.

#### **Conclusion:**

The study highlights some significant risk factors for SAM associated with feeding practices. These risk factors can very well be modified by parental education and counselling regarding infant feeding practices and should be stressed upon every visit.

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