Psychosocial Care and its Association with Severe Acute Malnutrition

This cross-sectional study compared 120 children having severe acute malnutrition with 120 healthy children for exposure to 40 behaviors, by measuring psychosocial care based on Home Observation for Measurement of the Environment (HOME) inventory. The mean (SD) psychosocial care score of cases and controls significantly differed [18.2 (2.2) *vs* 23.5 (2.1); *P*<0.001]. A score of less than 14 was significantly associated with severe acute malnutrition (OR 23.2; 95% CI 8.2, 50).

Keywords: *Home environment, Undernutrition.*

India is home to more than one-third of the world's undernourished children, out of which 6.4% children are severely malnourished [1]. Nutritional status is influenced by three broad factors: food, health and care [2]. There is a significant gap in knowledge on the relationship of psychosocial care and the nutritional status of under-five children in India. Home Observation for Measurement of the Environment (HOME) is a descriptive profile which yields a systematic assessment of the caring environment in which the child is reared [3]. We conducted this cross-sectional study at a hospital in Jodhpur, India, from December 2013 to November 2014, in which 120 children (age 6 mo-3 y) with severe acute malnutrition (as per WHO criteria) were included. Children with congenital heart disease, chronic metabolic and systemic disease, and known chromosomal anomalies were excluded. Similar number of control children were selected from amongst the healthy children (children attending the under-five clinics and not meeting the criteria 'for SAM).

The adequacy of psychosocial care in the family was quantified using a questionnaire consisting of 40 questions (similar to the one used in the infant and toddler HOME inventory for children aged 6 months to 3 years) in a 30 min interview (by one of the authors) with the parents. The following behaviors were observed during the interview: (*a*) responsiveness or sensitivity and maternal consistency in dealing with the child's needs; (*b*) acceptance of the child by the mother; (*c*) attachment or involvement with the child; (*d*) encouragement for autonomy and active stimulation of the child's development. Each positive answer was given a score of 1. The total score was divided into 3 tertiles (0-13, 14-27, 28-40) indicating inadequate, intermediate and adequate psychosocial care. All the data were analyzed with the help of Statistical software STAR PACK version 3.0.

The mean (SD) inventory score for cases was 18.2 (2.2) and for controls it was 23.5 (2.1) (*P*<.001). SAM was strongly associated (OR 23.2, 95% CI 8.2, 50) if the child had score <14. We found statistically significant differences between cases and controls in many behaviors in various subscales (***Table* I**).

TABLE I COMPARISON OF PSYCHOSOCIAL CARE IN CHILDREN WITH SAM AND CONTROLS

Questions	*Cases (n=120)*	*Controls (n=120)*	*OR (95% CI)*	*P value*
Mother spontaneously vocalizes to child	52 (43.3%)	90 (75%)	0.25 (0.15, 0.44)	<0.001
Mother labels objects for child	36 (30%)	102 (85%)	0.08 (0.04, 0.14)	<0.001
Mother has a positive response to praise of child	67 (55.8%)	115 (95.8%)	0.05 (0.02, 0.14)	<0.001
Restricts movements	67 (54.8%)	5 (4.8%)	29.1 (11.1, 76.3)	<0.001
Usually older sibling takes care of child rather than parents	82 (68.3%)	17 (14.1%)	13.0 (6.9, 24.8)	<0.001
Regular check-up	30 (25%)	110 (91.6%)	0.03 (0.01,0.07)	<0.001
Role playing toy	15 (12.5%)	73 (60.8%)	0.09 (0.05, 0.18)	<0.001
Toys for literature and music	10 (8.3%)	73 (60.8%)	0.06 (0.03, 0.12)	0.008
Keeps child in visual range	30 (25%)	110 (91.6%)	0.03 (0.01, 0.07)	0.005
Invests in toys with value	25 (20.8%)	98 (81.6%)	0.06 (0.03, 0.11)	0.003
Father provides care-taking	5 (4.2%)	89 (74.1%)	0.02 (.01, .04)	<0.001
Eats one meal with mother/father	28 (23.3%)	103 (85.83%)	0.05 (0.03, 0.1),	0.004
Illiterate mothers and lower (0-13) inventory scores			11.2 (2.1, 60.9)	0.005

We observed that poor psychosocial care had high association with malnutrition, and that the interactions between SAM children and their parents were less optimal than for the controls. The restriction of movement leading to lesser interaction with the surroundings, curtailed independence, volition activity, and the ability to ask for or obtain food could lead to malnutrition [4]. If mother is also illiterate, it further increases the chances of developing severe acute malnutrition [5]. The limitations of this study were small sample size and a hospital-based setting that could not delineate the actual home environment.

We feel that it is imperative that the psychosocial care environment of the child suffering with severe acute malnutrition be thoroughly probed using a questionnaire such as the one suggested in our study, and psychosocial care and rehabilitation should be brought into focus and stressed during the management of the malnourished child.

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Oxygen Saturation Index – A Noninvasive Tool for Monitoring Hypoxemic Respiratory Failure in Newborns

Neonatal lung disease is assessed using oxygenation index or PaO2 to FiO2 ratio. Both these measures require painful arterial punctures [1-3].

Continuous monitoring of these babies is done by measuring oxygen saturation with pulse oximeter (SpO2). SpO2 is linearly related to partial pressure of oxygen in the middle portion of oxygen dissociation curve. Most of the sick children on ventilatory support fall in this range. Hence noninvasive Oxygen saturation index (OSI) can be used in lieu of OI. OSI is calculated by dividing the product of mean airway pressure (MAP) and FiO2 with SpO2, and has been validated in pediatric population [4]. However, there are no prospective studies done exclusively in neonates.

We set out to find out the correlation between OI and OSI as well as determine the values of OSI corresponding to mild, moderate and severe lung disease.

This was a prospective study conducted on mechanically ventilated neonates who had blood sampling done for arterial blood gas measurement for their clinical indications. Neonates with congenial heart disease and who had SpO2 above 98% were excluded. Arterial blood gas was done using Gem 6000 machine 30 seconds after recording a stable SpO2 from post-ductal site with Philips intellivue monitor.

Formulae used for calculation of OSI:

OSI = (MAP) X (FiO2)) / (SpO2). FiO2 and SpO2 are expressed as decimals

OI = (MAP) X (FiO2%) / (PaO2)

Pearson product moment correlation and Correlation coefficient with linear mixed effect model between OI and OSI and OSI corresponding to OIvalues for mild, moderate and severe disease (OI of <5, 5-15 and >15) was calculated. Fifty-four neonates, both term and preterm, were recruited. Thirty six neonates were on conventional, and 18 were on high frequency ventilation. A total of 141 datasets were obtained. Minimum SpO2 recorded was 70% in one patient. Pearson product moment correlation (r) for OSI and OI was 0.91 (***Fig.* 1**). Sub group analysis yielded R = 0.96 for babies on high frequency and R = 0.95 for babies on conventional ventilation ($P<0.001$). Linear Mixed effect model yielded the y intercept of 1.6 and