Children in a playroom in Puduchery, India

Sensory stimulation and play therapy: Benefits in the treatment of severe wasting in India?

Nisha Kamble is an Occupational Therapist working with the State Centre of Excellence in Paediatric Nutrition at the B.J. Wadia Hospital for Children, Mumbai.

Radhika Mathur is a Paediatrician and Senior Project Medical and Research Officer working at the State Centre of Excellence in Paediatric Nutrition at the B.J. Wadia Hospital for Children in Mumbai.

Vrushabh Gavali is a Consultant Paediatric Neurologist working in the Department of Paediatric Neurology at B.J. Wadia Hospital for Children, Mumbai.

Sanjay Prabhu is a Senior Paediatric Consultant in charge of the State Centre of Excellence in Paediatric Nutrition at the B.J. Wadia Hospital for Children, Mumbai.

Bhaskar Krishnamurthy is an Assistant Professor in the Department of Clinical Pharmacology at Seth GSMC and KEM Hospital, Mumbai.

Minnie Bodhanwala is the Chief Executive Officer of the Wadia Group of Hospitals.

Background

Across the globe, an estimated 45.4 million children under the age of five are affected by wasting (UNICEF/WHO/World Bank, 2021). Those children suffering from severe wasting are at an exceptionally high risk of poor growth outcomes and are also thought to be at a high risk of motor and cognitive delays as brain development is further inhibited with increasing severity of malnutrition (Prado & Dewey, 2014). Children are particularly vulnerable to malnutrition in their first two years of life when growth velocity and brain development are especially high.

As per the World Health Organization (WHO) guidelines (WHO, 2013), the management of complicated severe wasting in inpatient settings is divided into three phases: stabilisation, transition and rehabilitation. Once children with severe wasting have recovered their appetite and have been treated for medical complications, they enter the rehabilitation phase which aims to promote rapid weight gain, stimulate emotional and physical development and prepare the child for normal feeding at home. Following those recommendations, Indian healthcare guidelines include the provision of sensory stimulation and play therapy as detailed in Step Nine of the inpatient treatment of children with severe wasting (Government of India, 2011).

Sensory stimulation and play therapy for children with severe wasting

Sensory stimulation integrates various ways to promote expressive behaviours. It helps babies and children to learn and reach developmental milestones through the activation of one or more of our five senses: seeing, hearing, touching, tasting and smelling.

Play therapy is an interactive method used to interact with children. This model includes developmental play capacities (cognitive, physical and social play skills) and individual play styles (internal control, freedom to suspend reality and intrinsic motivation). Play reflects the child's cognitive, motor, language and social skills. Physical play helps the children to refine locomotion, hand-eye coordination and manipulation skills (Cooper, 2000). Play therapy is used to achieve optimal arousal and to develop cognitive and social skills (Gardner et al, 1999).

According to Kerac et al (2010), there is a lack of data on the current practice of the basic WHO recommendations for play and stimulation activities for children with severe wasting at hospitals and healthcare centres and there is need to better document the feasibility of conducting sensory stimulation and play therapy. A few, more recent studies have begun to document the subject.

A study in Ethiopia found that, for children with severe wasting, sensory stimulation and play therapy enhances the improvement of gross motor functions when combined with standard nutrient-rich diets but it can enhance these gross motor functions even when such standard dietary care is not available (Abessa et al, 2019). Hence, family-based sensory stimulation and play therapy in a low-income setting have the potential to improve the development, linear growth and nutritional outcomes in children with severe wasting.

In Malawi, the provision of a four-day programme of counselling and psychosocial stimulation to primary caregivers and their children who were hospitalised with severe wasting did not result in improved developmental or nutrition outcomes, likely due to the programme's short duration. Other studies of psychosocial stimulation interventions for children with severe wasting, which showed positive effects on child development, were more rigorous and continued beyond discharge from inpatient care. (Daniel et al, 2021).

Our study

To understand the developmental outcomes resulting from sensory stimulation and play therapy in patients with severe wasting, we conducted a short-term observational study at the Nutritional Rehabilitation Centre (NRC) at Bai Jerbai Wadia Hospital for Children, an urban tertiary paediatric care centre in Mumbai. This article aims to share our results with the hope that our learnings will inform other practitioners and, in turn, benefit children from high-burden countries.

The NRC at Bai Jerbai Wadia Hospital for Children is a referral site for a large catchment area surrounding the city of Mumbai with an increased population density of lower- and lower middle-income groups which contributes to relatively high numbers of child admissions with severe wasting. This study was conducted to understand the developmental outcomes after sensory stimulation and play therapy in various developmental domains in patients with severe wasting admitted to the NRC and to identify any difference between children with co-morbidities as compared to those without co-morbidities. Being a tertiary care centre, many of our patients

Table 1 Paired t-test comparing social age pre and post intervention

Domain	Pre intervention Mean ± SD	Post intervention Mean ± SD	Difference (Change)	t-value	p-value
Gross motor	61.33 ± 27.23	69.78 ± 26.08	-8.45 ± 16.94	-3.526	0.001*
Fine motor	65.90 ± 26.39	71.28 ±25.73	-5.38 ± 13.79	-2.760	0.008*
Language	64.44 ± 29.78	68.16 ± 27.10	-3.71 ± 18.87	-1.391	0.170
Social	59.53 ± 26.72	75.64 ± 23.69	-16.11 ± 20.66	-5.517	< 0.001*
Cognition	19.38 ± 22.67	19.64 ± 19.49	0.26 ± 24.00	-0.076	0.939

n=50 * indicates a statistically significant difference

Table 2 Comparison of the change in social quotient pre- and post-intervention for children with co-morbidities and those without co-morbidities

Domain	With co-morbidity (n=12) Mean ± standard deviation	Without co-morbidity (n=38) Mean ± standard deviation	p-value
Gross motor	7.78 ± 7.85	8.66 ± 19.02	0.818
Fine motor	9.63 ± 9.66	4.04 ± 14.71	0.139
Language	5.48 ± 9.19	3.16 ± 21.10	0.594
Social	10.49 ± 9.58	17.90 ± 22.90	0.117
Cognition	0.49 ± 1.96	0.19 ± 27.60	0.970

have co-morbid conditions such as cerebral palsy, congenital cardiac defects, chronic respiratory illness or abnormal anatomical conditions such as a cleft lip/palate which can affect overall improvement in neurodevelopmental outcomes after play therapy. Moreover, there is no literature available that differentiates the developmental outcomes between these two groups. We excluded children with congenital deformities, uncontrolled epilepsy and a history of recent surgery as it was not possible to provide interventions to those children at the time.

After the stabilisation phase, the children were assessed by the occupational therapist and given sensory stimulation in conjunction with structured play therapy. The Vineland Social Maturity Scale (VSMS) was used to assess the initial developmental parameters in five domains, namely: gross motor, fine motor, language (expressive and receptive), socio-emotional and cognition. VSMS is a scale used to measure the adaptive abilities, or social competence, in a purposeful manner in various social settings in each domain. It therefore assesses the child's ability to adapt to various social challenges which in turn is termed social adaptive behaviour. Social adaptive behaviour is measured in the form of social age in the various domains in VSMS. The social quotient in each domain can then be calculated by representing the social age as a proportion of the chronological age. The scoring is often interpreted as 90-100% being normal, 80-90% as low-normal and less than 80% as inadequate.

A minimum of 10 play sessions each lasting 40 minutes were held in the presence of the caregiver in the playroom only, or both in the playroom and the playground, depending on the age and health status of the child. By attending play sessions, the parents were actively included and were encouraged to continue these activities at home after discharge. Children were reassessed using VSMS post-intervention.

Our observations

Out of 86 admissions in the NRC from January 2020 to March 2021, 50 patients (58.1%) aged between one month and five years were recruited for sensory stimulation and structured play therapy. Amongst those admitted, we excluded children with deformities, uncontrolled epilepsy and a history of recent surgery.

There were 12 patients enrolled in the study who had co-morbidities and 38 who did not have co-morbidities. The developmental outcomes were summarised in terms of pre- and post-intervention social age. Statistical significance was set at $p < 0.05$.

There was a significant difference in gross motor, fine motor and social development pre- and post-intervention which indicates that the intervention was successful.

When comparing the changes of social quotient observed between the two groups (children with co-morbidities and those without co-morbidities), we observed no statistically significant difference in any of the domains (Table 2). There was no difference in the milestone improvement, post-intervention, between children with pre-existing co-morbidities and those without.

Discussion

In this experience, we observed that children treated for severe wasting benefited from the sensory stimulation and play therapy that was provided in addition to the nutrition rehabilitation in the gross motor, fine motor and social domains, Similar findings were seen in a pilot study conducted across 10 NRCs in India where it was concluded that sensory stimulation and play therapy are an integral part of the management of inpatient severe wasting and that maternal involvement in play therapy is crucial (Kumar et al, 2021). This benefit was independent of the presence or absence of co-morbidities.

Currently, the treatment of severe wasting in the NRC is primarily to provide medical nutrition therapy. The inability to provide sensory stimulation and play therapy has been a neglected aspect of the holistic management of severe wasting. Children who are wasted also suffer from delays in motor and cognitive milestones so a focus on this area of development appears to be warranted in order for all children to thrive and achieve their potential. After the stabilisation phase, there is a window of opportunity to provide sensory stimulation and to involve the child in play activities which may in turn make their stay in the NRC an enriching experience. Although not explored in this study, there may be particular benefit for children who are wasted and have nutritional oedema who otherwise tend to remain either withdrawn or are irritable.

In our NRC, we have a dedicated occupational therapist who offers this service to all patients admitted for treatment. As per the WHO recommendation, and based on our experience, we strongly advise regular sensory stimulation and play therapy for a severely wasted child by either an occupational therapist or a health care worker who is trained by an occupational therapist to provide the same at each nutrition centre. The approximate cost for the equipment, which includes toys, games, etc., would be around USD 500 per centre which does not have an occupational therapy department or a linked District Early Intervention Centre (DEIC). However, if the latter is available then the cost would further reduce to around USD 100 which can be considered value for money.

Nevertheless, we identified certain challenges during our implementation of this intervention including a lack of maternal motivation and determination as well as the occasional lack of family support. This leads to a discontinuation of continued stimulation at home after discharge. We were able to gather this information based on regular post discharge follow-ups and reviews which were initially maintained weekly followed by bi-monthly.

Further to this, we do understand that home-based management of uncomplicated severe wasting is important and for that reason it is important to have a strong home-based Early Child Development component as well (Kumar et al, 2021).

The main limitation of this study was that there was no control group in this setting. Due to the standards of care recommended by the WHO, it would be unethical to deprive any patient of the therapy so the inclusion of such a control group was unfeasible. Without a control, it is difficult to determine whether the positive impacts were attributed to the intervention alone, hence a strong recommendation for introducing sensory stimulation and play therapy cannot be made at this point despite these promising findings.

Conclusion

The results of our study suggest that receiving sensory stimulation and play therapy benefits

children who have severe wasting, especially in the gross motor, fine motor and socio-emotional domains. The presence or absence of co-morbidity did not affect the outcome which indicates that sensory stimulation is as beneficial when children have co-morbidities as when they do not.

Based on both our clinical experience and these findings, we believe that sensory stimulation should preferably be included in all NRCs via occupational therapists, trained health care workers or linkage to DEIC. The components of this therapy should also be integrated in the follow-up programme and carried out by frontline health workers. Stating this, we also think that more research should be conducted across multiple centres in various countries to develop concrete guidelines for this promising intervention.

For more information, please contact Radhika Mathur at
dr.radhikamathursharma@gmail.com

References

Abessa T, Worku B, Wondafrash M et al (2019) Effect of play-based family-centered psychomotor/psychosocial stimulation on the development of severely acutely malnourished children under six in a low-income setting: a randomized controlled trial. BMC Pediatrics, 19, 1, 336.

Cooper R (2000) The impact of child abuse on children's play: a conceptual model. Occupational Therapy International, 7, 4, 259-276.

Daniel A, van den Heuvel M, Voskuijl W et al (2017) The Kusamala Program for primary caregivers of children 6–59 months of age hospitalized with severe acute malnutrition in Malawi: study protocol for a cluster-randomized controlled trial. Trials, 18, 550.

Daniel A, Bwanali M, Tenthani J et al (2021) A Mixed-Methods Cluster-Randomized Controlled Trial of a Hospital-Based Psychosocial Stimulation and Counseling Program for Caregivers and Children with Severe Acute Malnutrition. Current Developments in Nutrition, 5, 8.

Gardner J, Grantham-McGregor S, Himes J et al (1999) Behaviour and development of stunted and nonstunted Jamaican children. Journal of Child Psychology and Psychiatry, and Allied Disciplines, 40, 5, 819–827.

Government of India (2011) Operational Guidelines on Facility-based Management of Children with Severe Acute Malnutrition. Ministry of Health and Family welfare; Government of India. http://rajswasthya.nic.in/MTC Guideline- MOHFW.pdf

Kerac M, Mcgrath M, Grijalva–Eternod C et al (2010) Management of Acute Malnutrition in Infants (MAMI) Project Technical Review: Current evidence, policies, practices & programme outcomes.

Kumar P, Rohatgi S, Singh P et al (2021) Strengthening Psychosocial Stimulation in the Management of children with Severe Acute Malnutrition: Experience from a Nutritional Rehabilitation Centre. Indian Pediatrics, S42-S45.

Prado E and Dewey K (2014) Nutrition and brain development in early life. Nutrition Reviews, 72, 4, 267–284.

UNICEF/WHO/World Bank (2021) Levels and trends in child malnutrition: key findings of the 2021 edition of the joint child malnutrition estimates. Geneva: World Health Organization.

WHO (2013) Guideline: Updates on the management of severe acute malnutrition in infants and children. Geneva: World Health Organization.

Group work during NIPN Uganda workshop

National Information Platform for Nutrition: An overview

Barbara Baille is a Nutrition Advisor at Capacity for Nutrition-National Information Platforms for Nutrition (C4N-NIPN) Global Coordination team, a component implemented by the GIZ and based in Brussels, Belgium.

What is NIPN?

The National Information Platforms for Nutrition (NIPN) initiative was launched by the European Union in 2015 with the goal of supporting partner countries who are part of the global Scaling Up Nutrition movement. These countries have committed to delivering evidence-based programmes and interventions to improve human nutrition in their progress towards the 2030 Agenda for Sustainable Development Goal number 2 – to "end hunger, achieve food security and improved nutrition and promote sustainable agriculture". Responding to the need to maximise the use of existing data while also creating the demand to fill data gaps, the main objective of the NIPN initiative is to create country-led and country-owned information platforms for nutrition to strengthen national capacities in the analysis of nutrition information and data, in order to better inform policymakers in the areas of policy, programme and investment for nutrition.

The first phase of the initiative was implemented in nine countries: Bangladesh, Burkina Faso, Ivory Coast, Ethiopia, Guatemala, Kenya, Lao PDR, Niger, and Uganda. To support each country's implementation and to coordinate technical assistance and capacity building, a Global Support Facility was established in 2015. As of 2020, the Global Coordination Facility has been managed by Capacity for Nutrition (C4N), a joint action financed by the EU and the German Federal Ministry for Economic Cooperation and Development and implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

NIPN partners work under one common results framework that focuses on: strengthening technical ability to provide relevant nutrition information and analysis, enhancing the demand by policy makers for NIPN outputs, and strengthening the national ownership of NIPN.

Between 2021 and 2022, all NIPN platforms – except for Bangladesh, where the project closed in early 2022 due to other government priorities – have gradually entered the second funding cycle of the initiative, NIPN Phase II. In this new phase, GIZ delivers technical and programme management assistance for the implementation of the platforms in Ethiopia and Niger. In Burkina Faso, Ivory Coast, Kenya, Lao PDR, and Uganda, UNICEF provides the technical and programme management assis-