

ROLE OF PLAY THERAPY ON THE MANAGEMENT OF SUDANESE CHILDREN WITH SEVERE PROTEIN ENERGY MALNUTRITION

دور المعالجة عبر اللعب في تدبير حالات سوء التغذية البروتيني الطاقى الشديد عند الأطفال

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ملخص البحث

هدف البحث: تهدف هذه الدراسة إلى تقييم أثر العلاج النفسي الحركي عن طريق اللعب على سرعة شفاء حالات سوء التغذية البروتيني الطاقى الشديد MEP عند الأطفال.

طرق البحث: أجريت هذه الدراسة التداخلية في مستشفى الأطفال التعليمي بمنطقة ودمدني بولاية الجزيرة وسط السودان وقد شملت 42 طفلاً اختيروا عشوائياً مقبولين في المشفى بحالة سوء تغذية بروتيني طاقى شديد. تم إخضاع 20 حالة (مجموعة التداخل) لجلسات تأهيل نفسي وحركي عن طريق اللعب لمدة 40 دقيقة يومياً بالإضافة إلى المعالجة بالحمية المعتمدة على تركيبة الحليب عالي الطاقة عالي الحريات، وقورنت النتائج مع 22 طفلاً آخرين (مجموعة عدم التداخل) خضعوا للمعالجة الغذائية نفسها ولكن لم يتم إدراجهم ضمن جلسات التأهيل النفسي الحركي. كانت المجموعتان متوافقتان من حيث العمر والجنس.

النتائج: بلغت نسبة الذكور للإناث في عينة الدراسة 1:1.3، متوسط العمر 5.98 ± 21.50 و 6.81 ± 21.25 شهراً في مجموعة التداخل IG ومجموعة اللاتداخل NIG على الترتيب. لوحظ أن معظم الحالات كانت تعاني من سوء تغذية شديد (أقل من 3 انحرافات معيارية) وذلك عند 19 مريضاً (95%) و 20 مريضاً (98%) في مجموعة التداخل ومجموعة اللاتداخل على الترتيب. لوحظ انتشار كبير للوذمات في المجموعتين (10 مريضاً بنسبة 50% و 13 مريضاً بنسبة 59% في مجموعة التداخل ومجموعة اللاتداخل على الترتيب). كان معظم المرضى من المناطق الريفية حيث توجد نسب عالية من الأمية (70% من الأمهات أميات). أظهرت الدراسة وجود فارق هام إحصائياً بين المجموعتين بالنسبة للتحسن في الشهية وزيادة وزن الجسم، حيث أظهرت مجموعة التداخل زيادة بمقدار 2.72 ± 10.87 غرام/يوم بشكل متوافق مع توصية برامج التغذية العلاجية. لوحظ من جهة أخرى حدوث تغيرات هامة من حيث التفاعل الاجتماعي والسلوك النفسي الحركي لدى المرضى في مجموعة التداخل.

الاستنتاجات: أكدت الدراسة فعالية العلاج عن طريق استخدام اللعب وأثر الارتباط الوثيق بالوالدين أثناء الجلسات بالنمو العاطفي وانعكاسات ذلك على تدبير الحالة عند الأطفال المصابين بسوء التغذية البروتيني الطاقى الشديد PEM.

ABSTRACT

Objective: The aim of this study is to assess the influence of play therapy on enhancing the recovery of children with severe protein energy malnutrition (PEM).

Methods: This hospital based interventional study

included 42 randomly selected children with severe PEM, admitted to Wad Medani Children Teaching Hospital, central Sudan. Twenty patients (intervention group, IG) were treated with two weeks daily high-protein, high-caloric dietary milk formula for PEM and about 40 minutes per day play therapy sessions,

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compared to 22 (non-intervention-group, NIG) patients who received the same dietary milk formula but not exposed to the play therapy sessions. The two groups were matching with respect to age and sex.

Results: Male to female ratio was 1.3:1. The mean age was 21.50 ± 5.98 and 21.25 ± 6.81 months for the IG and NIG respectively. Most of the patients were severely malnourished (< 3 SD) (19 patients (95%) and 20 patients (98%) in IG and NIG, respectively). There was a high prevalence of edema; (10) 50%, and (13) 59% of IG and NIG, respectively. Most patients were from rural settings with high prevalence of illiteracy, 70% of mothers were illiterate. The study showed significant statistical correlation between the two groups with regard to improvement of appetite, increase in body weight. The IG showed 10.87 ± 2.72 g/day increment conforming with therapeutic management programs. The social interaction and psychomotor behavior changed significantly in the IG.

Conclusions: Play therapy is indeed effective, and close parental relationships are important for emotional wellbeing and has a significant effect on management of children with severe PEM.

INTRODUCTION

Malnutrition contributes to more than half of all child deaths, about 5.6 millions per year.¹ More than one quarter of all children under the age of five in developing countries are suffering a life-threatening degree of malnutrition.² Sudan is one of these poorest countries in which PEM is highest in children of this age.^{3,4}

Malnutrition affects the developing nervous system and associated with both structural and functional pathology of the brain. The developing brain is more vulnerable than the mature one to the effects of PEM. Neuro- psychological affection is the hallmark of CNS involvement in PEM.⁵ Cognition and abstraction ability and neuro-psychologic performance were the worst hit by PEM.⁶ On the long term infantile PEM; have been demonstrated to impair the fine motor skills at adolescence and development of manual in-dexterity.⁷

Psychologists claim that play therapy is important for

social, moral, cognitive and psychomotor development in early childhood.⁸ However, assessment of cognitive abilities of young children before language development is less known and difficult to assess compared to the major milestones. Simple observation of the child's use of toys or objects can help determine cognitive progress.⁸ The infant can be encouraged to look for a hidden toy or participate in a game. The infant anticipation of reappearance indicates his development of the concept of object permanence. Similarly, the toddler's ability to play with a toy (e.g. a car or a telephone) indicates the emergence of symbolic thought. Hence, play is the highest development in childhood, not simple sport. It is full of meaning and significance.⁹

Play therapy has been recognized as important since the time of Plato (429-347 B.C).^{10,11} It is generally employed with children 3 years of age to 11 years and provides a way for them to express their experiences and feelings through a natural, self-guided, self-healing process.¹² Play has been determined to be an essential component of healthy child development and it has been directly linked to cognitive development.¹³ In this way it can be used as a self-help mechanism, as long as children are allowed time for "free play" or "unstructured play". A play therapist observes a child playing with toys to determine the cause of the disturbed behaviour.¹¹ The objects and patterns of play, as well as the willingness to interact with the therapist, can be used to understand the underlying rationale for behavior both inside and outside the session.

In the 1938, David Levy developed a structured approach technique, called release therapy, expanded later by Gove Hambidge.¹⁴ A child, who had experienced a specific stressful situation, would be allowed to engage in free play. Stimulating environment, outside the gloomy nutritional wards is essential for a structured play therapy sessions for 15-30 minutes a day to be performed.¹⁵ Physical activity as soon as the child is well enough may enhance the child improvement.¹⁶

The WHO manual for current case management practices for severely malnourished children has just mentioned the role of psychomotor stimulation of PEM

children without describing how to perform it.¹⁷ In this study we tried to assess the role of psychomotor and play therapy in improving the mood, appetite and hence body weight gain in children with severe PEM.

METHODS

The study population consisted of children with severe PEM admitted to the nutritional wards at Wad Medani Children Teaching Hospital, Gezira State in central Sudan. Forty two children admitted with severe PEM (≤ 3 SD weight for supine length or height) were included in this study. Any child who fails to attend ≥ 5 play sessions or a child with evidence of severe sepsis or infection and diarrhea was excluded from the study.

This hospital based interventional study carried out during the period from 1st of August to 30th of December 2009. The patients with PEM usually stay for 2-3 weeks and followed up in 2 weeks time after discharge in the Nutritional Referred Clinic.

Mothers were interviewed before, during and after the test with a semi-structured questionnaire, including their opinion regarding the improvement in the change of the child mood and appetite. Anthropometric measurements were taken and data were transformed into height-for-age, weight-for-age and weight-for-height ratios.

All children were managed in the nutritional wards, where a milk formula (Gezira formula) was prepared and supplied to these children according to a conventional schedule, supervised by a nutritionist and full time nutritional nurses. There were two formulae, prepared in two concentrations; the initial formula which is equivalent to WHO formula (F75) and provides 70 k.cal/100 ml, 1.1 g of protein per 100 ml, given in a dose of 100 ml/kg/day.¹⁸ This formula usually continued until the child showed weight gain in non-edematous child and loss of weight in edematous one, plus improvement in temperament. Then he/she will be shifted to the maintenance formula that provides 130 k.cal/ml and 3.1 g of protein in a dose of 100 ml/kg/day. Potassium, zinc and multivitamins were supplemented with both formulae.

Twenty four children identified as severe malnourished (interventional group IG) were involved in play sessions 30-40 minutes each day for seven days, following the initial phase of feeding, more or less adopting David Levy technique emphasizing his structured approach.¹⁹ Each child had a minimum of 5 sessions during his stay in the hospital, which ranges between 2 to 3 weeks, these could have been on daily bases but the shortage of staff and the hospital busy days allowed number of sessions. These play sessions were performed in a separate compartment not far away from the nutritional wards. Each play session includes about 10 children, supervised by a psychologist and a trained nutritional nurse. During the sessions the mothers or caregivers were encouraged to be involved in playing with their children using stimulating colored toys and advised to participate in object permanence tests, i.e. looking for hidden toys. Physical activity was started by encouraging the child to stand and walk with the mother help as soon as he/she is well enough.

Twenty two malnourished children matched by age and sex and nutritional status but not exposed to psychomotor stimulation and play therapy, were recruited as a control (non-interventional group).

Nutritional improvement was assessed by rate of weight gain. The aim is a weight gain per day of ≥ 10 g/kg/day. The child weight was checked and recorded every morning before being fed. The weight gain was calculated and recorded every 3 days. If the weight gain is poor (< 5 g/kg/day) or moderate (5-10 g/kg/day) the child will be reassessed fully by checking the intake target or screen for infection. Improvement of mood, interaction and appetite were also considered important indicators of improvement. Parents were advised to come to the referred clinic 2 weeks after discharge.

The results were analyzed using SPSS statistical package. Approval of Faculty Research Committee in Medical Ethics was obtained.

Shortcomings: Assessment of serum albumin although, more objective indicator of improvement was not done, for financial reasons.

RESULTS

Forty-two children with severe PEM were recruited in this study, 20 as (IG) and 22 as (NIG) matched by age and sex with male to female ratio of 1.3:1. The (IG) mean age was 21.50 ± 5.98 compared to 21.25 ± 6.81 months of the (NIG). Table 1 shows that most of the patients were severely malnourished (<3 SD) in 19 (95%) and 20 (100%) in IG and NIG respectively. High prevalence of edema was noticed in both groups, that is; (10) 50%, and (13) 59% of IG and NIG respectively.

Socioeconomic demographic features indicated that most of the patients were from rural settings 14 (70.0%). More than 50% of parents from both groups had received no education of any sort; this was more prevalent among mothers from both groups 14 (70%). A considerable number of children from both groups were cared for by grandmothers or relatives as shown in Table 1.

Table 2 shows significant improvement of appetite and consequently mean daily weight gain among IG compared to NIG; 10.87 ± 2.72 and 05.79 ± 1.83 , respectively. Oedema is considered as a sign of severity

and its loss is an indicator of improvement it disappeared in 9 (90% of IG group compared to 3 (13.60%) of NIG, with a p-value of 0.00. Similarly there was statistically significant difference in change of mood and interaction among both groups.

Regarding readmission and death there was no significant difference between the groups during a follow up period of two weeks in the referred clinic. Table 3 shows variables used for all patients in the sessions as the ages of all selected group passed these milestones, which regressed due to nutritional disorder. These tests were used to assess the psychomotor changes, and showed significant changes in the interventional group compared to NIG with p-value 0.000. Children in the IG who participated in play games and encouraged to move and walk all cases above 15 months of age, did better than those who were involved in the play games only, suggesting that, the motor activity component is important as well.

Caregivers response to improvement in mood, interaction and appetite, showed that 96% of respondents indicated improvement in all these parameters.

		Interventional group (IG)	Non-interventional group (NIG)	(χ^2)/ p-value
Malnutrition grade	Grade 1	0 (0%)	0 (0%)	1.127 (0.476)
	Grade 2	1 (5%)	2 (2%)	
	Grade 3	19 (95%)	20 (98%)	
Oedema	Present	10 (50%)	13 (59.1%)	0.349 (0.390)
	Absent	10 (50%)	9 (49.9%)	
Father education	Literate	9 (45%)	9 (40.9%)	0.072 (0.517)
	Illiterate	11 (55%)	13 (59.1%)	
Mother ducation	Literate	6 (30%)	10 (45.5%)	1.061 (0.239)
	Illiterate	14 (70%)	12 (54.5%)	
Residence	Rural	14 (70.0%)	13 (59.1%)	1.159 (0.841)
	Suburban	5 (25.0%)	6 (27.2%)	
	Urban	1 (05.0%)	3 (13.6%)	
Child guardian	Mother	10 (50%)	14 (63.6%)	0.613 (0.834)
	Grandmother	2 (10%)	4 (18.2%)	
	Relative	8 (40%)	8 (36.4%)	
Child readmission during study period	Readmitted	2 (10%)	4 (18.10%)	0.478 (0.406)
	Not readmitted	17 (90%)	18 (81.90%)	

Table 1. Clinical and demographic characteristics of patients.

Variables	Interventional group (IG)	Non-interventional group (NIG)	p-value
Mean (SD) weight gain (g/day)	10.87±2.72	05.79±1.83	0.00
Mean (SD) hospital stay (days)	17.05±2.77	20.42±1.83	-
Improved appetite (No. %)	15 (75%)	3 (13.63%)	0.00
Loss of oedema	9 (90%)	3 (13.6%)	0.00
Proportion of children died (No. %)	1 (5%)	2 (9.09%)	0.69

Table 2. Clinical indicators of improvement.

Variables	Interventional group (IG)		Non-interventional group (NIG)		p-value
Hold on and give back objects	17	85%	5	22.72%	0.000
Looking for a hidden toy	16	80%	4	18.18%	0.000
Able to walk and room about	14	70%	7	31.81%	0.000
Become less irritable	19	95%	8	36.36%	0.000
Interact with other children	20	100%	6	27.27%	0.000

Table 3. Psychomotor indicators of improvement.

In this study, 5 of IG and 3 of the NIG were escaped before day five. They were dropped out and replaced by other patients.

DISCUSSION

Nervous system (NS) suffers significantly from dietary deficiencies because of lack of regenerative power of neurons once damaged. The chance of ultimate recovery even with plenty of diet and other measures may be miserable.²⁰ Chronic protein energy malnutrition affects the ongoing development of higher cognitive processes during childhood. Neuropsychological affection is the hallmark of CNS involvement. Apathy, irritability, attention deficit, language disturbances, frayed social skills, declining intelligence quotient (IQ) and blunted abstraction have been described with variable emphasis.²⁰ All recruited children from both groups (IG and NIG) presented initially with variable neuropsychological disorders. The listless apathy, misery, easy irritability and severe anorexia are striking and constant features in acute stage of PEM with oedema. Anorexia, apathy and misery are somewhat less in patients without oedema.

Fine motor disturbance was noticed in all children in this study and ascribed to poor interaction and associated weakness. Soft neurologic signs like clumsiness in repetitive motor tasks and motor incoordination at an

early age of PEM children predict later development of manual inexterity, i.e., poor handiness, though previous neurologic signs may disappear.⁷

According to David Levy “release therapy technique” a child, who had experienced a specific stressful situation, would be allowed to engage in free play. Subsequently, the therapist would introduce play materials related to the stress-evoking situation allowing the child to rebuild the traumatic event and release the associated emotions.²¹ Cognition and neuropsychologic performance were the worst hit by PEM that results in severe stress and emotional disturbance of victimized child. In this study poor interaction was noticed in all participants. Psychomotor related improvement was observed on tests of interest and interaction and improved concentration in malnourished children in the IG compared to NIG. This improvement was clear among children who were involved in both games and motor activities. The weight gain per day showed a remarkable difference. It was moderate (5-10 g/kg/day) to high (10 g/kg/day) in the IG group and poor (<5 g/kg/day) in the NIG group. The dropout level is usually high in cases of PEM as many patients escaped against the medical advice. In this study any child failed to attend ≥ 5 sessions was dropped off and replaced by another case. Finally the sample ends up with 20 in the IG and 22 in the NIG.

Edema was considered a sign of PEM severity and its loss is usually considered an indicator of improvement. Cases with edema are observed to be more common in these cases, Table1. In this study edema disappeared, in 90% of IG compared to 13% of NIG. Although, loss of oedema in itself is an important indicator of improvement, it reflects in the amount of weight gain, where usually a patient loses weight particularly during the first days of management. Probably on long term follow up, more marked improvement in weight gain can be recognized, and patients in the IG are more likely to maintain their nutritional status. However, it was observed that malnourished children who had had edema on admission took longer time to interact as compared to wasted children without edema and performed poorly initially, on tests of attention, interaction and object permanence tests.

Studies on intellectual disability in PEM children and the influence of psychomotor intervention are lacking. Filial therapy, developed by Bernard and Louise Guerney, was a new innovation in play therapy during the 1960's. The filial approach emphasizes a structured training program for parents in which they learn how to employ child-centered play sessions in the home. With the advent of school counselors, school-based play therapy contribute significantly, especially in terms of using play therapy as both an educational and preventive tool in dealing with children's issues.²²

Virtually no comparisons of different play therapies with long follow-up times have been done.²³ There is considerable controversy about which form of play therapy is most effective, and more specifically, which types of therapy are optimal for treating which sort of problems.²² Furthermore, it is controversial whether the form of therapy or the presence of factors common to many psychotherapies, best separates effective therapy from ineffective therapy. Although both group were selected as index and control aiming to decrease the confounding factors to the minimum possible and exposed to the same dietary care and therapy apart from the play therapy. The latter was thought to be of great value as part and parcel of the management of children with severe protein energy malnutrition.

CONCLUSIONS

This study showed that play therapy in a form of playing with colored toys is an effective way to help children with severe PEM. More research is required to determine the most cost-effective intervention in each part of the nutritional care protocol, in a variety of healthcare settings and across all age ranges, to impact upon nutritional and clinical outcomes. A malnourished child needs interaction with others who are supposed to provide tender loving care. Play as it has been directly linked to cognitive development, it can be used as a self-help mechanism, as long as children are allowed time for "free play" or "unstructured play." The application of play therapy to all PEM children in the ward and at home is recommended

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