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Catch-up growth assessment in long-term physically neglected and emotionally abused preschool age male children

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Abstract

Objective: To assess the catch-up growth of long-term physically neglected and emotionally abused preschool male children who have entered foster residential care and remained 1 year after initial placement.

Method: Longitudinal study over a 7-year period (1994–2001). So that a child was eligible for the study, three selection criteria were included: (1) aged between 24 and 48 months at the time of entry into residential facility, (2) having suffered both long-term (more than 6 months) physically neglected and emotionally abused, and (3) having stayed in foster care for 1 year after initial placement. Weight, height, and head circumference were established upon entry and re-assessed 1 year after initial placement, calculating the annual growth velocity. Results were compared with normal regional longitudinal standards of reference (*Z* score). Student's *t* test was used to assess statistically significant differences.

Results: During the study period, 87 children aged between 24 and 48 months (54 male/33 female) were admitted to residential facility after having suffered both long-term physical neglect and emotional abuse. Nevertheless, only 20 children (23% of the total admissions) met the third selection criteria (having remained 1 year after initial placement). Of these children, all were males and at placement they were between the ages of 30 and 42 months, with an average age of 36 months (1.9 *SD*). At placement, the analyzed parameters were below the normal standards, showing a statistically significant difference for height (*Z* score = -1.29 ; $p = .008$) and weight (*Z* score = $-.75$; $p = .038$). The annual growth velocity for all parameters was above the normal standards showing a statistically significant difference for height (*Z* score = $+1.43$; $p = .009$). One year after initial placement, the significant differences for height (*Z* score = $-.68$; $p = .102$) and weight (*Z* score = $-.31$; $p = .435$) with respect to the normal

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standards disappeared, though still remained below, showing a significant catch-up growth for height (improvement height $Z = +.61 SD$).

Conclusions: At placement, the both long-term physically neglected and emotionally abused preschool age male children showed a mild form of chronic malnutrition with growth failure. Growth failure was reversible after the first year of stay, which demonstrates that this delay in growth was secondary to nutritional and psychosocial factors. Placement in foster residential care was beneficial for the catch-up growth of these patients.

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Introduction

Through previous studies, we know that a high rate of children that have entered foster institutional care in Spain because of having suffered abuses and neglect during a variable period of time evidence physical health problems, different forms of malnutrition and a delay in growth and development (Oliván, 1999a, 1999b, 2002).

The objective of the present study was to assess the catch-up growth of preschool age children who have entered foster institutional care (residential facility) in Zaragoza City (650,000 pop.), Spain, after having suffered both long-term physical neglect and emotional abuse and who have remained 1 year after initial placement.

Patients and methods

A longitudinal study was performed over a 7-year period (January 1994–January 2001). Three selection criteria were included for a child to be eligible for the study: (1) aged between 24 and 48 months at the time of entry into residential facility; (2) having suffered both long-term (more than 6 months) physical neglect and emotional abuse; and (3) having stayed in foster care 1 year after initial placement.

Weight, height, and head circumference were established upon entry and re-assessed 1 year after initial placement, calculating the annual growth velocity. The measurement was always carried out by the same individual in the morning between the hours of 9 and 10. Internationally accepted techniques for auxological studies were followed (Cameron, 1986). The technical equipment used consisted of a Seca platform scale (10 g) with incorporated stadiometer for height and nonextensive millimeter metric measuring tape.

The descriptive statistic of the analyzed parameters was performed through the operative program StatView 4.0. The collected data were compared with normal regional longitudinal standards of reference processed by Ferrández (1988). For the comparative study, Z score (Standard Deviation Score) was calculated, assessing typical deviations that distance our data from the mean values of reference for age and sex (Gorstein, Sullivan, & Yip, 1994). The existence of statistically significant differences was calculated by the comparison of two means (Student's t test), with a level of significance at $p < .05$.

Table 1

Values of the analyzed parameters and their comparison with normal regional longitudinal standards of reference

Parameter	Maltreated children		Standard of reference		Z score	p value*
	Mean	SD	Mean	SD		
At placement (mean age 36 months)						
Weight (kg)	13.84	.50	14.93	1.45	-.75	.038
Height (cm)	92.27	1.54	96.78	3.48	-1.29	.008
Head circumference (cm)	49.68	.52	50.40	1.26	-.57	.183
Annual growth velocity						
Weight (kg)	2.34	.29	1.97	.72	+.51	.215
Height (cm)	9.21	.61	7.44	1.24	+1.43	.009
Head circumference (cm)	.84	.14	.63	.40	+.52	.142
One year after initial placement						
Weight (kg)	16.18	.66	16.71	1.70	-.31	.435
Height (cm)	101.48	1.62	104.27	4.09	-.68	.102
Head circumference (cm)	50.52	.52	50.96	1.26	-.35	.405

* Student's *t* test not paired.

Results

During the study period, 87 children aged between 24 and 48 months (54 male/33 female) were admitted to residential facility after having suffered both long-term physical neglect and emotional abuse. Nevertheless, only 20 children (23% of the total admissions) who entered foster care during the study period met the third selection criteria (having remained in the residential facility 1 year after initial placement). Of these children, all were males and at placement they were between the ages of 30 and 42 months, with an average age of 36 months (1.9 *SD*). No female stayed in foster care 1 year because they were adopted or returned with their biological families from the residential facility.

Table 1 summarizes the values of weight, height and head circumference at the time of entry and 1 year after initial placement, the annual growth velocity of these parameters and its comparison with normal regional longitudinal standards of reference (*Z* score, *p* value).

At placement, the analyzed parameters were below the normal standards showing a statistically significant difference for height (*Z* score = -1.29; *p* = .008) and weight (*Z* score = -.75; *p* = .038). The annual growth velocity for all parameters was above the normal standards, showing a statistically significant difference for height (*Z* score = +1.43; *p* = .009). One year after initial placement, the significant differences for height (*Z* score = -.68; *p* = .102) and weight (*Z* score = -.31; *p* = .435) with respect to the normal standards disappeared, though still remained below, showing a significant catch-up growth for height (improvement height $Z^* = +.61$ *SD*). *{improvement height $Z = [(height\ Z\ 1\ year\ after\ initial\ placement) - (height\ Z\ at\ placement)]$; significant catch-up growth when $Z\ score\ improve \geq .5\ SD$ }.

Discussion

Admittedly, placement of children into foster residential care in situations of social risk during the first years of life has had unfavorable effects on their physical and psychological development. However, in recent years, the foster residential care models in Spain have changed substantially in all the orders decreasing partly the negative effects of institutionalization when compared with previous years. This makes the separation of a child from the social and family environment which is causing his maltreatment a valid, temporary solution (Oliván et al., 1994). Articles even exist that refer to a greater catch-up growth in children remaining in foster care when compared with children who remained in their home under the supervision and the support of the Social Services (King & Taitz, 1985; Taitz & King, 1988).

During the first 3 years of life, the factors that improve growth are nutrition, environmental conditions and emotional factors. Prolonged deprivation secondary to maltreatment gives rise to the syndrome of “failure-to-thrive,” better defined as “growth and developmental delay of psychosocial origin” (Oliván, 1999b; Wilcox, Nieburg, & Miller, 1989). This delay of growth can be totally or partially reversible when the child is separated from the abusive environment (King & Taitz, 1985; Oliván, 2001; Taitz & King, 1988; Wyatt, Simms, & Horwitz, 1997).

For the assessment of nutritional status through the anthropometrical method, the basic measure are height and weight for age, weight for height and the Z scores of said parameters (Gorstein et al., 1994). A deficit of weight for height represents a situation of acute malnutrition and a deficit of height for age represents a situation of under nutrition of long duration, which is to say, a situation of chronic malnutrition with growth failure.

In the group of preschool male children studied, we have determined that: at the time of entry into foster care a height and weight significantly below the normal standard were present, indicating the existence of a mild form of chronic malnutrition with growth failure; during their stay in foster care, two findings were noted: (1) a significant increase of the annual growth velocity for height was evident and (2) at the end of the first year after placement, the significant differences for height and weight with respect to the reference standard disappeared.

Based on our results, we can conclude that this group of both long-term physically neglected and emotionally abused preschool age male children was affected by a delay of growth secondary to nutritional and psychosocial factors. Placement in foster residential care was beneficial for the catch-up growth of these patients.

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Résumé

Objectif: Évaluer le rattrapage du niveau de la croissance de garçons d'âge préscolaire qui avaient souffert pendant une longue période de négligence et de mauvais traitements psychologiques, après avoir été confiés à un placement familial pendant une durée d'un an.

Méthode: On a fait une étude longitudinale pendant une période de 7 ans (1994–2001). Pour qu'un enfant puisse être inclus dans l'étude, trois critères de sélection devaient être satisfaits: (1) Être âgé de 24 à 48 mois au moment du placement; (2) avoir souffert pendant au moins six mois de négligence physique et de mauvais traitements psychologiques; (3) avoir séjourné dans la famille d'accueil pendant un an. Le poids, la taille et la circonférence crânienne ont été notées à l'entrée et mesurées à nouveau un an après le placement, en calculant la vitesse de la croissance annuelle. On a comparé les résultats avec les standards de référence longitudinaux de la région (*Z* scores). Le test de Student a été utilisé pour évaluer si les différences étaient statistiquement significatives.

Résultats: Durant la période de l'étude, 87 enfants de 24 à 48 mois (54 garçons et 33 filles) ont été admis dans un placement après avoir souffert pendant une longue période à la fois de négligence physique et de mauvais traitements psychologiques. Toutefois, seulement 20 enfants (23% des admis) ont satisfait au 3^{ème} critère de sélection (être resté au placement au moins un an). Tous ces enfants étaient des garçons et ils avaient entre 30 et 42 mois, avec un âge moyen de 36 mois (1.9 *SD*). Au placement, les paramètres analysés étaient inférieurs à la moyenne montrant une différence statistiquement significative pour la taille (*Z* score = -1.29 ; $p = .008$) et pour le poids (*Z* score = $-.75$; $p = .038$). La vitesse de croissance annuelle pour tous les paramètres était inférieure à la moyenne montrant une différence statistiquement significative pour la taille (*Z* score = $+1.43$; $p = .009$). Un an après le placement initial, les différences significatives pour la taille (*Z* score = $-.68$; $p = .102$) et pour le poids (*Z* score = $-.31$; $p = .435$) en comparaison avec les standards normaux, ont disparu, bien qu'ils soient demeurés bas montrant que la croissance avait été rattrapée de façon significative pour la taille (gain en taille: *Z* = $+0.61$ *SD*).

Conclusion: Au moment du placement les enfants d'âge préscolaire qui avaient souffert à la fois d'une négligence physique et de mauvais traitements psychologiques, présentaient une forme légère de malnutrition chronique ainsi qu'un retard de croissance. La croissance s'est montrée réversible après la première année de séjour, ce qui démontre que ce retard de croissance était secondaire à des facteurs psycho-sociaux et de nutrition.

Resumen

Objetivo: Evaluar el crecimiento de recuperación de preescolares varones víctimas de negligencia física y abuso emocional de largo plazo quienes han entrado al cuidado de hogares sustitutos y permanecieron por 1 año después de la colocación inicial.

Método: Estudio longitudinal por un periodo de 7 años (1994–2001). Se incluyeron tres criterios de selección para elegir un niño en este estudio: (1) edad entre 24 y 48 meses en el momento de entrar en la facilidad residencial; (2) haber sufrido tanto negligencia física y abuso emocional de largo plazo (más de 6 meses); y (3) haber estado en cuidado sustituto por 1 año después de la colocación inicial. Se establecieron el peso, altura y circunferencia de la cabeza al entrar y se re-evaluaron 1 año después de la colocación inicial, calculando la velocidad anual de crecimiento. Los resultados se compararon con parámetros normales regionales de referencia (puntaje Z). Se utilizó la t de Student para evaluar diferencias estadísticamente significativas.

Resultados: Durante el período de estudio, 87 niños de edad entre los 24 y 48 meses (54 varones/33 hembras) fueron admitidos a la facilidad residencial después de haber sufrido tanto negligencia física y abuso emocional de largo plazo. Sin embargo, solo 20 niños (23% del total de admisiones), llenaron el tercer criterio de selección (haber estado 1 año después de la colocación inicial). De estos niños, todos eran varones y al asignarlos tenían edades de 30 a 42 meses, con una edad promedio de 36 meses (1.9 SD). En la entrada, los parámetros analizados estaban por debajo de lo normal, presentando una diferencia significativa para la altura ($Z = -1.29$; $p = .008$) y el peso $Z = -.75$; $p = .009$). Un año después de la colocación inicial, las diferencias significativas para la altura ($Z = -.68$; $p = .102$) y el peso $Z = -.31$; $p = .435$) en relación a los parámetros normales desaparecieron, a pesar de que permanecieron bajos, mostrando un crecimiento de recuperación significativo para la altura (mejoría de la altura $Z = +.61 SD$).

Conclusión: Al inicio de la colocación, los preescolares varones víctimas de negligencia física y abuso emocional de largo plazo mostraron una leve forma de malnutrición crónica con fracaso en el desarrollo. El fracaso en el desarrollo fue reversible después del primer año de permanencia, lo que demuestra que este retraso en el desarrollo era secundario a los factores nutricionales y psicosociales. La colocación en cuidado residencial sustituto fue beneficiosa para el crecimiento de recuperación de estos pacientes.