

# Peculiarities of Physical and Neuropsychological Development of Early Age Children who Lack Parent Care

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## ABSTRACT

The physical, motor and psychosocial development has been studied in early age children (3 - 24 months old) who lack the family environment. Neurologic (N), expressive (E), receptive (R) and cognitive (C) functions are assessed by BINS (Bailey's Infant's Neurodevelopmental Screener). The results of the study are compared to the developmental indicators of children who grew in families. In the case of deprivation syndrome, in children who lack parent care there is the evidence of delayed physical development with disharmonic type. The indicators of neurological clusters are decreased; expressive and cognitive functions show significant impairment. As the child grows we see the improvement of Neurological and Receptive clusters, but expressive and Cognitive functions show marked depression. There is still the evidence of previously mentioned deviations during the time of two-year monitoring. The results of the study show the significance of the family environment and of the biophysical union between mother and child on the processes of child's development; it also shows the importance of implementation of the multidisciplinary model in institutional houses for the development of children.

**KEYWORDS:** *early age children, lack parent care, children's institutional houses, deprivation syndrome (psychosocial), physical/neuropsychological development*

Children who live in institutional houses mainly have the lonely mothers, are members of lower social group, or have poor economic situation in their families. The biosocial environment in which the given contingent are born and developed often helps to maintain incomplete working or social habits. Deprivation syndrome and lack of family environment significantly stipulate child's delayed development, which is often expressed by the disruption of speech and behavior, difficulties in social adaptation and low academic attendance during school years [1]. Biomedical factors are also important for child's development. Pre-, post- and neonatal risk factors determine prematurity, low birth weight, traumas, infections, hyperbilirubinemia and respiratory distress, which is often the reason of development of disabled child [2,3,4,5]. In the convention of children's rights it is mentioned, that family and child's direct environment is the basement for his/her rights to be secured. The objective of this work is to study the physical, motor, psychosocial and neurological development of early age children who lack family environment; also to determine the role of psychosocial deprivation on the development of early age children.

## MATERIALS AND METHODS

The research was conducted on practically healthy children aged 3-24 months. 104 of them were from Tbilisi children's institutional house and 41 from complete families. The process of two-year monitoring has been carried after primary single research. The distribution of children in age groups by their chronological age is represented in Tab.1.

Their health condition was studied; physical development was assessed by anthropometric data - body mass, length, and chest and shoulder circumferences; harmony between somatotype and development was defined; the results were assessed by centile tables and by the maps for physical development given by WHO. Neurological status was assessed by BINS [6]. On the base of four main clusters of the screener it was possible to assess the intactness of the CNS, determine the muscle tone, development of behavior and study of speech, receptive and cognitive functions.

## RESULTS

Given results show the significant delay of physical development in children who live in institutional houses. In the whole group of children who lack the family environment the following age (normal) indicators of physical development are revealed: body mass in 10%; body length in 25%; head circumference in 42%; chest circumference in 75%. From the age of one month to one year harmonic physical development is noticed in 34%; and from one to three years only in 4%. The shoulder circumference from 1 to 3 years oscillated within normal age ranges, but the ratio of shoulder and chest circumference was retarded from norm.

By BINS, the assessment of four main clusters - neurological, receptive, cognitive and expressive was conducted through 6 age groups according to their chronological age. The data of children who grew within families is represented in table 2. At the age of 3-4 months neurological, receptive and expressive clusters assess child's development. At that period neurological functions are of primary importance, and only partial importance has expressive function. At the age of 5-6 months receptive processes begin to develop, and neurological, expressive and cognitive functions are also important. The children of 7-10 months old show recognized and reasonable actions, expressive functions and motor developments are the major. By 11-15 months expressive and cognitive clusters develop. Child begins to walk, gets information, realizes it and acts accordingly. At the age of 16-20 months previously mentioned clusters are leading, oral-motor functions become stronger. At 21-24 months expressive cluster is of main importance, as well as motor and verbal functions. The indicators of neuropsychological clusters are represented on Fig.1.

The results of BINS assessment in early age children who lack the parent care in comparison to those children who grew within family environment revealed reliable difference of expressive function in every age group. Depression of neurological cluster indicator at the age of 3-4 months, receptive cluster was decreased at 11-15 months; expressive cluster at all ages, depression of cognitive function in the age groups of 5-6 months, 11-15 months and 16-20 months (Tab.2). Comparing the total

Groups	Number of children	3-4 months	5-6 months	7-10 months	11-15 months	16-20 months	21-24 months	number of studies
Early age children grown in families	41	30	26	29	31	25	26	167
Early age children who lack parent care	104	22	18	26	46	22	10	144
Total	145	52	44	55	77	47	36	311

**Tab.1** Distribution of children by their chronological age and number of conducted studies.

Neurological clusters	3-4 months M ± m	5-6 months M ± m	7-10 months M ± m	11-15 months M ± m	16-20 months M ± m	21-24 months M ± m
N	3,95 ± 0,3 p<0,02	1,90 ± 0,30	2,85 ± 0,07	2,90 ± 0,06	0,80 ± 0,11	0,80 ± 0,13
R	1,80 ± 0,08	1,001	0,27 ± 0,09	1,3 ± 0,12 p<0,001	0,07 ± 0,06	1,00 ± 0,26
E	2,10 ± 0,19 p<0,001	2,08 ± 0,30 p<0,01	2,65 ± 0,35 p<0,001	1,20 ± 0,14 p<0,001	2,13 ± 0,48 p<0,001	4,70 ± 0,58 p<0,001
C	—	1,58 ± 0,23 p<0,01	2,27 ± 0,13	1,40 ± 0,11 p<0,001	1,40 ± 0,16 p<0,001	0,20 ± 0,13
Total	7,90 ± 0,40 p<0,001	6,58 ± 0,70 p<0,01	8,00 ± 0,40 p<0,001	6,78 ± 0,30 p<0,001	4,40 ± 0,54 p<0,001	6,70 ± 0,84 p<0,001

**Tab.2** Indicators of main neurological clusters of 3-24 months old children who lack family environment and comparison of these indicators to the data of control group.

outcome of neurological clusters revealed reliable difference at every age between given groups (Fig.2).

#### DISCUSSION

The results of the research shows that early age children who lack parent care have markedly decreased indicators of physical development, which is clearly shown by body mass, length and chest circumference. Disharmonic physical development is revealed in 2/3 of children younger than 1 year with micro- and messmate types, but from the age of 1 year we see only disharmonic type of development. Study of such motor activities as sitting, standing and walking is related to their life style. Delayed neurological development is clearly seen at 3-24 months. As the child gets older, indicators of neurological and receptive clusters -muscle tone, development of visual and tactile processes (reception and perception) become better, but expressive and cognitive functions - fine-motor, gross-motor, oral-motor and such higher functions as memory, learning, justice, purposeness, attention and ability of decision making show marked depression. The period of 2-year monitoring revealed negative dynamics of development, there are distinct examples of delayed cognition, as well as expression, reception and speech.

We think, that problems mentioned above are related to the characteristics of pre-; post-; and neonatal periods, to the cleavage of biopsychological union between mother and child, also to the deficiency of family environment,

existing psychosocial deprivation and at last to the characteristic living conditions in institutional houses in which grow children.

#### CONCLUSION

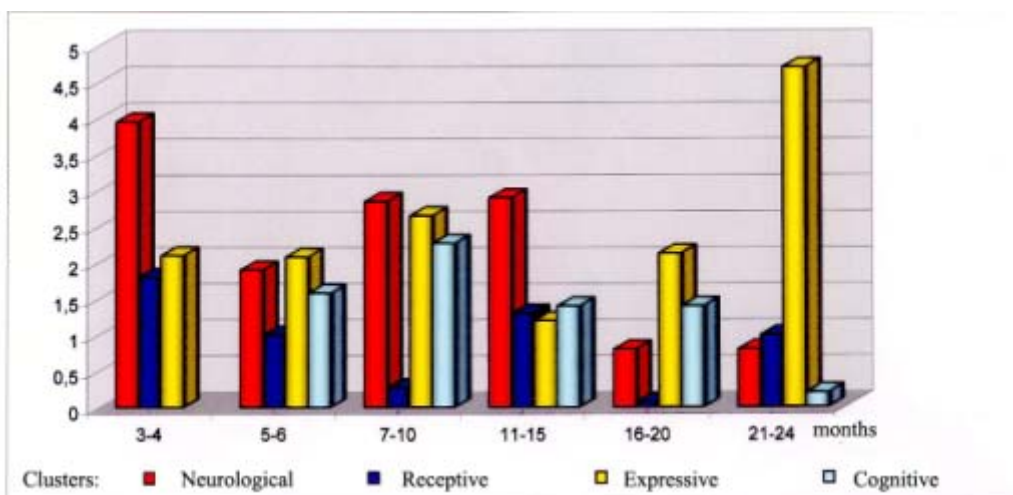
\* The multidisciplinary model represents the system for complete assessment of child's development. Use of this model is especially important for the children who have the deprivation syndrome and are grown in incomplete environment.

\* The indicators of physical development of children who lack parent care are markedly retarded from age norms. Deviations from body mass, length and shoulder circumferences are important.

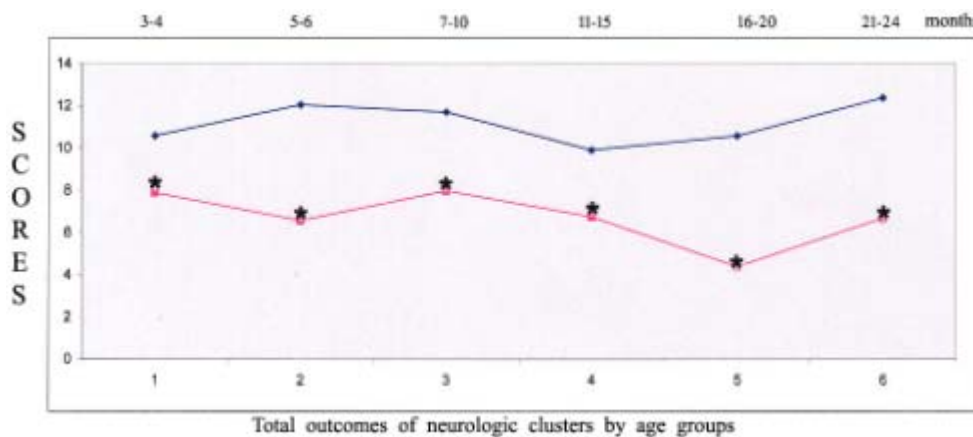
\* There is the evidence of delayed neuropsychological development in receptive, expressive and cognitive functions in early age children who lack parent care; impairment of expressive function is seen at the age of 3-24 months, and decrease of cognitive function at 5-20 months.

\* After 2 year monitoring of early age children who lack parent care, the positive dynamics in expressive function and in total amount of clusters is not seen. We think that the reason of above mentioned is the environment in which leave and grow early age children who lack parent care.

\* Serial evaluations with the BINS give us opportunities to assess the level of development of early age children, and predict the risk of progression of the dysfunction.



**Fig1.** Assessment of neuropsychological status of early age children who lack parent care by BINS.



■ Early age children who lack parents care. ◆ Early age children within families. \* Difference is statistically valid.

**Fig2.** Assessment of neuropsychological status of early age children who lack parent care and who grow within families by BINS (comparison of total outcome of neurologic clusters).

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## Особенности физического и нейропсихологического развития детей, лишенных семейной среды

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### Р Е З Ю М Е

Изучен физический, моторный и психосоциальный статус у детей, лишенных семейной среды в возрасте 3 - 24 месяцев. Неврологические, рецептивные, экспрессивные и ментальные кластеры оценивались по BINS (Bailey's Infant's Neurodevelopmental Screener). Полученные результаты сравнивались с данными развития детей, выросших в семейной среде. В возрасте 16 - 24 месяцев улучшаются данные неврологических и рецептивных кластеров - повышаются тонус мышц и тактильные процессы, но значительно снижаются экспрессивные и когнитивные функции. У депривированных детей выявлено отставание физического развития, достоверное снижение неврологических, экспрессивных и когнитивных кластеров. Двухлетнее мониторинговое наблюдение не выявило положительной динамики. Данные исследования указывают на важную роль семейной среды и биопсихологического союза матери и младенца в процессах развития детей, о необходимости внедрения мультидисциплинарной модели в детских учреждениях.

**КЛЮЧЕВЫЕ СЛОВА:** дети, лишенные семейной среды, детское институциональное учреждение, депривационный синдром (психо-социальный), физическое развитие, нейропсихологическое развитие