24 - COGNITIVE AND MOTOR DEVELOPMENT OF TWIN CHILDREN WITH MENTAL DISEASE

ALMEIDA, Geciely Munaretto Fogaça[1]
SCHLINDWEIN-ZANINI, Rachel[2]

INTRODUCTION

The childhood is a stage of primordial life for the development of a human being, under the cognitive, psychological, biologic and motor aspects, because in this period the maturations in one's organism take place. The development of a child involves a series of modifications which begin within the conception and continue along the entire life, going through different stages and suffering the interference of the environment (COLE e COLE, 2003).

Papalia and Olds (2000) affirm that the motor skills of children improve as these stages of development happen. For Rosa Neto (2002), the development and learning of a child are intrinsically linked to motor skills, which show them to be fundamental to the global development of a child. A good motor control promotes appropriate exploration of environments, from concrete experiences, which are part of the intellectual children's development.

Researches as Wallon, Piaget, Vayer, Le Boulch e Fonseca point the thin line between the movement and the learning process of a child. Fonseca (2004) affirms that the interaction between two components is what defines the human behavior: the motor skills and the psychism. For Wallon, the movement plays a fundamental role in the affectivity and also in the cognition, and it is extremely important this comprehension as a whole (GALVÃO, 2003).

Except the difficulties of the development related to the earlier birth, twins and other triplets and other multiple children have the same intellectual capacity of other children. As many multiple children are born prematurely, they can present, during their first years, the delays associated to early birth or to the low weight when they are born. Even though, most of them overcome this delay when they start school. However multiple children develop the intellectual and language abilities in a different context of those lived by other children. They grow next to one or more siblings of the same age, and, then, they often have less individual interaction with adults, what creates advantages and disadvantages (MALMSTROM, POLAND, 2004).

The study of Schlindwein-Zanini (2009) investigated the mental maturity of monozygotic twins and conclude that both twins reached good results in the evaluation (CMMS), showing the same level of maturity.

There are evidences that monozygotic twins raised together have an environment which is more similar than the dizygotic raised together, for they tend to study more often at the same class and to share more extracurricular activities (SPITZ, 1996).

Facing the importance of the subject and the lack of studies about the cognitive aspects in twins there is a necessity of researches in this area (SCHLINDWEIN-ZANINI, 2009).

Considering the interdependence between the motor development and the cognitive development, it is also function of the researchers, to analyze and try to understand this relation in all types of population, as it is the case of twin children with mental disease, an almost unknown universe.

The prevalence of mental disease is approximately 1% (DSM-IV-TR™, 2006), affecting up to 2% of children at school age (CURRY et al, 1997). In Brazil, 1,6% of the population present this condition (IBGE, 2006). The individual with mental disease present an intellectual functioning significantly under the average, which is usually diagnosed during the childhood or adolescence.

Considering the motor activity as fundamental in the global development process of a child, this study has the objective of evaluating and comparing the motor development of twin children with mental disease.

METHODOLOGY

At first, some special schools of Santa Catarina were contacted, to raise the number of enrolled twin children. After talking to 9 special schools, only one informed to have at the school a pair of twin girls attending regularly the classes.

So, two monozygotic female twin children, 11 years and four months old, attending to fundamental special school.

The children's parents have fundamental school, the mother is a housewife and the father collects on the streets paper to be recycled for a living. They have 8 children, including the twin girls mentioned before.

It was sent to the parents a Term of Free and Clarified Consentient, after being authorized, the children took the following evaluations:

Motor Evaluation: performed by a physiotherapist, in an appropriate environment (light and ventilation), through applying the tests of the Motor Development Scale EDM (Rosa Neto, 2002), which evaluates the following motor areas: fine motor skill, global motor skill, equilibrium, body aspects, special organization, time organization and laterality. The average time of the application was 30 minutes with each child.

Cognitive Evaluation: performed by a psychologist in an appropriate environment (light and ventilation). To obtain the estimated IQ, the subtests of the Wechsler Intelligence scale for children WISC III (Wechsler, 2002) were applied individually. This scale is indicated to individuals from 6 to 16 years old and permits to obtain the estimated Intelligence Quotient (estimated IQ) through the application of two subtests (cubes and vocabulary).

RESULTS E DISCUSSIONS

Two twin girls were evaluated (monozygotic), at the age of 11 years and 4 months, both attending to a special fundamental school, under the “motor development” and cognitive development” aspects.

Motor development

Through the General Motor Quotient (QMG) obtained, it was shown that the twins presented a “very low” motor development (under 69), corroborating with other researches which investigated the motor development of children with mental disease (SOUZA, 1997; MARINELLO, 2001; ALMEIDA, 2007; ALMEIDA e SCHLINDWEIN-ZANINI, 2008).

Table 1 shows the motor results of the two children, didactically named “G1” and “G2”.

Table 1 Values referring to the motor development of the sample.

Variables	G1	G2
Chronological age (IC)	136m	136m
General motor age (IMG)	66m	60m
Negative age (IN)	-70m	-76m
Fine motor skills (IM1)	60m	48m
Global motor skills (IM2)	60m	48m
Equilibrium (IM3)	72m	60m
Body aspects (IM4)	72m	72m
Spatial organization (IM5)	72m	72m
Time organization (IM6)	60m	60m
Motor general quotient (QMG)	48,5	44,1
Fine motor skills (QM1)	44,1	35,3
Global motor skills (QM2)	44,1	35,3
Equilibrium (QM3)	52,9	44,1
Body aspects (QM4)	52,9	52,9
Spatial organization (QM5)	52,9	52,9
Time organization (QM6)	44,1	44,1
Laterality	Crossed	Crossed
GENERAL MOTOR DEVELOPMENT	Very low	Very low

As it can be seen, the motor development of the twin children with mental disease was low, so that the difference between chronological age (IC) and motor general age (IMG) was negative on the children with the disease (-70 and -76 months of motor delay). The motor development level of twin children with mental disease was classified by EDM as “very low” (ROSA NETO, 2002). These results corroborate other studies that used the same instrument, as Souza (1997), who evaluated 20 children from 7 to 12 years old with mental disease from APAE Florianópolis/ SC (APAE is an institution that works with special children); Marinello (2001) who evaluated 25 students from 6 to 13 years old with mental disease from APAE Tubarão/ SC, Almeida (2004) who evaluated 09 children from 06 to 14 years old with Down Syndrome from APAE Palhoça/ SC e Almeida (2007) who evaluated 65 children from 06 to 11 years old with mental disease in the special schools of Florianópolis and region, in Santa Catarina.

There was no big difference in the motor development between the pair, so that the motor classification level were the same: “very low”. The laterality of both was evaluated as “crossed”. The biggest deficits were fine motor skills, global motor skills and time organization, areas of great importance in the children's global development.

Cognitive development

Through the estimated Intelligence Quotient (IQ) obtained, the children presented similar deficit estimated IQ (68), corroborating with other studies that investigated the intelligence of children with alterations in their development (FOBE et al, 1995; ALMEIDA e SCHLINDWEIN-ZANINI, 2008).

The data obtained in this study show deficit related to non-verbal and vision-spatial thinking, and the verbal area. In the cognitive aspect, in the comparison between the twins, it is emphasized that both had similar results, in the final results and along the execution and comprehension of the tasks.

Children with mental disease usually present a global development lower than children with no alterations in their development (ALMEIDA e SCHLINDWEIN-ZANINI, 2008).

According to Diamond (2000), the cognitive deficits appear connected with motor problems, because of the inter-relation between the two areas. It is important to highlight that its alterations might be confused with psychiatric diseases, reinforcing the importance of a differential diagnosis and the neuropsychological evaluation (SCHLINDWEIN-ZANINI, PORTUGUEZ, COSTA, 2007).

González (2000) studied the influence of the cognitive development during some motor games in 20 children and concluded that the stages of cognitive development influence significantly in the problems resolutions during the motor games.

In the study of Fobe et al (1995), with 45 children with hidrocefalism and mielomeningocele, the IQ is directed correlate to the functional motor level. Mello et al (1999) investigated 83 premature children and found motor alterations. From this group, 15 presented cognitive alterations. Peres (2004) investigated 7 children with brain paralysis, who participated of a motor intervention program during a semester (26 sessions) and concluded that the games can facilitate the cognitive and motor development of those children, because there was improvement regarding the motor coordination, equilibrium and to hold objects. It was also observed an improvement on children's attention, with naming and learning the colors.

The psychological, neuropsychological and psychomotor evaluation of twins must be done carefully, as well as comparing the results among them. Because the existing relation among them present aspects that differ from that among fraternal siblings. The way that this link happens and remains surrounds the development of these children, which might reflect on the psychological, psychomotor and neuropsychological aspects.

Monozygotic twins tend to share achievements, to comprehend the condition of the sibling (when it differs from his/her condition), compete and show him/her sympathy at difficulties.

As well as monozygotic twins are singular individuals, they are alike, however, they differ from the others from a unique link with a great friend: their sibling (SchlindweinZanini, 2009).

CONCLUSION

Throgh this study, it was concluded that:

Both involved evaluations (cognitive and motor) showed similirities in their results.

The motor and cognitive development of twin children with mental disease was low.

The General Motor Quotient (QMG) was classified as “very low”.

The estimated Intelligence Quotient (IQ) was deficit.

The motor and cognitive development showed a positive relation: as the level of motor development raises, the cognitive development level raises tôo, corroborating the literature and the data of other studies.

It is necessary more studies involving twin children, a very unknown universe.

BIBLIOGRAPHY

ALMEIDA, G.M.F. **Deficiência mental: avaliação e classificação do desenvolvimento motor.** Dissertação (Mestrado em Ciências do Movimento Humano). Universidade do Estado de Santa Catarina. Florianópolis/SC, 2007.

ALMEIDA, G.M.F.; ROSA NETO, F. Motor evaluation intervention in down Syndrome. **FIEP Bulletin**. 2006; 76: 413-416.
ALMEIDA, G.M.F.; SCHLINDWEIN-ZANINI, R. Evaluation of motor and cognitive development of children with mental retardation. **FIEP Bulletin**. 2008; 78: 27-29.
COLE, M.; COLE, S. **O desenvolvimento da criança e do adolescente.** 4ª ed. Porto Alegre: Artmed, 2003.
CURRY CJ, Stevenson RE, Aughton D, Byrne J, Carey JC, Cassidy S, et al. Evaluation of mental retardation: recommendations of a consensus conference. **J Med Genet.** 1997; 72.
DIAMOND, A. Close Interrelational of Motor Development of the Cerebellum an Prefontal Cortex. **Child Development.,** v.71, n.1, p.44-56, Jan/Fev, 2000.
DSM-IV. **Manual Diagnóstico e Estatístico de Transtornos Mentais**. 4ª ed. Porto Alegre: Artmed, 2006.
FONSECA, V. **Psicomotricidade: perspectivas multidisciplinares**. Porto Alegre: Artmed, 2004.
GALVÃO, I. **Henri Wallon: uma concepção dialética do desenvolvimento infantil.** Petrópolis: Vozes, 2003.
GONZÁLEZ, F.J. Influência do nível de desenvolvimento cognitivo na tomada de decisão durante jogos motores de situação. **Efdeportes - Revista Digital**. Buenos Aires - Año 5 - N° 25 - Setiembre de 2000. Disponível em <http://www.efdeportes.com>
IBGE, 2006. **Instituto Brasileiro de Geografia e Estatística**. Censo demográfico 2000. Disponível em: <http://www.ibge.gov.br>. Acesso: Junho, 2006.
MALMSTROM, P.M.; POLAND, J. **Criando filhos gêmeos**. São Paulo: M Books, 2004, 298 p.
MARINELLO, K.T. **Avaliação do desenvolvimento motor em escolares portadores de deficiência mental matriculadas na APAE de Tubarão/SC.** Monografia (Graduação em Fisioterapia). Universidade do Sul de Santa Catarina. Tubarão/SC, 2001.
MELLO, R.R.; MEIO, M.D.B.; MORSCH, D.S. et al. Ultra-sonografia cerebral neonatal normal no prematuro. **J. pediatr.** Rio de Janeiro;75(1):45-9, jan.-fev. 1999.
PAPALIA, D. e OLDS, S. W. **Desenvolvimento humano**. 7. ed. Porto Alegre: Artmed, 2000.
PERES, R.C.N.C. O lúdico no desenvolvimento da criança com paralisia cerebral espástica. **Rev. bras. crescimento desenvolv. hum.**;14(3):37-49, set.-dez. 2004.
ROSA NETO, F. **Manual de avaliação motora.** Porto Alegre: Artmed, 2002.
SCHLINDWEIN-ZANINI, R. Maturidade mental em gêmeos univitelinos. **Rev Neurocienc** 2009 - no prelo.
SCHLINDWEIN-ZANINI, R.; PORTUGUEZ, M. W.; COSTA, J. C. Epilepsia do lobo frontal na infância: aspectos psicológicos e neuropsicológicos. **Scientia Medica**, Porto Alegre, v. 17, n. 2, p. 93-96, abr./jun. 2007.
SOUZA, M. **Avaliação do desenvolvimento motor em crianças com deficiência mental da APAE de Florianópolis/SC**. Monografia (Graduação em Educação Física). Universidade do Sul de Santa Catarina. Florianópolis/SC, 1997.
SPITZ, E. Des jumeaux bien dociles. **La Recherche** 1996;283:73-5.
WECHSLER, D. **WISC-III: Escala de Inteligência Wechsler para Crianças**. Manual. 3ª ed. São Paulo: Casa do Psicólogo, 2002. [Adaptação e padronização de uma amostra brasileira por Vera Lúcia Figueiredo].

Contact:
Geciely Munaretto Fogaça de Almeida
Rua São Joaquim, 865. Ap. 11. Copacabana. Lages/SC. CEP.: 88504-011
Tel.: (48) 9104-1250 geciely@gmail.com

COGNITIVE AND MOTOR DEVELOPMENT OF TWIN CHILDREN WITH MENTAL DISEASE

ABSTRACT

Introduction: The childhood is a stage of primordial life for the development of a human being, under the cognitive, psychological, biologic and motor aspects, for in this period the main maturations in the organism take place, suffering a direct influence of the environment, especially in twins that live together. Children with mental disease present an intellectual functioning significatively under the average, that is usually diagnosed during the childhood or adolescence. **Objectives**: evaluate and compare the cognitive and motor development of twin children with mental disease. **Methodology**: This research sample was made of two monozygotic female children with mental disease, who are eleven years and four months old, students at a fundamental special school. The motor evaluation used Motor Development Scale tests - EDM (Rosa Neto, 2002) and the cognitive evaluation used subtests of the Wechsler Intelligence scale for children WISC III (Wechsler, 2002) and interview. **Results and conclusions**: The motor development level of children was “very low” (QMG under 69). The estimated IQ of both children was deficit (68). There was no big difference in the motor and cognitive development between the pair, It was clear the direct relation between motor skills and cognition, both fundamental in the global children's development.

Keywords: motor development, mental disease, Intelligence Quotient, twins.

DÉVELOPPEMENT MOTEUR ET COGNITIF D'ENFANTS JUMELLES AVEC INSUFFISANCE MENTALE

RÉSUMÉ

Introduction: L'enfance est une phase de la vie primordiale pour le dŽveloppement de l'□tre humain, sous les aspects cognitif, psychologique, biologique et moteur, donc dans cette pŽriode se produisent les principales maturations dans leur organisme, en souffrant interfŽrence directe du moyen, spŽcialement jumelŽe qui coexistent entre lui. Des enfants avec insuffisance mentale prŽsentent un fonctionnement intellectuel significativement au-dessous de la moyenne, en Žtant en r□gle gŽnŽrale diagnostiquŽe dans l'enfance ou l'adolescence. **Objectifs:** Žvaluer et comparer le dŽveloppement moteur et cognitif d'enfants jumelles avec insuffisance mentale. **MŽthodologie:** L'Žchantillon de cette recherche s'est composŽ de 2 enfants jumelles monozygotes avec insuffisance mentale, du sexe fŽminin, avec 11 ans et 4 mois, qui suivent des études dans une école spéciale. L'Žvaluation motrice a utilisŽ le test de l´Échelle de Développement Moteur (Rosa Neto, 2002) et l'Žvaluation cognitive a utilisŽ subtests de l´Échelle d«Intelligence de Wechsler pour les Enfants - WISC III (Wechsler, 2002) et entrevue. **RŽsultats et conclusions:** Le niveau de dŽveloppement moteur des enfants a ŽtŽ infŽrieur (le Quotient Moteur GŽnŽral au-dessous de 69). Le QI ade les jemelle a ŽtŽ basse (68). Il n'a pas eu une grande diffŽrence dans le dŽveloppement moteur et cognitif entre les soeurs. A ŽtŽ Žvidente la relation directe entre motricitŽ et connaissance, fondamentales dans le procŽs de dŽveloppement global infantile.

Mot-CIŽ : dŽveloppement moteur, insuffisance mentale, QI, jumeaux.

EL DESARROLLO COGNITIVO Y MOTOR DE LOS NIÑOS GEMELOS CON DISCAPACIDAD MENTAL
RESUMEN

Introducción: La infancia es una etapa de la vida fundamental para el desarrollo de los seres humanos, en virtud de los aspectos cognitivos, psicológicos, biológicos y motor, porque en ese período ocurren las principales maturaciones en su cuerpo, sufriendo influencia directa de los medios, especialmente los gemelos que viven entre sí mismos. Los niños con discapacidad mental tienen un funcionamiento intelectual significativamente por debajo de la media, generalmente diagnosticada en la infancia o la adolescencia. **Objectivos**: Evaluar y comparar el desarrollo cognitivo y motor de niños gemelos con discapacidad mental. **Metodología**: La muestra de esta investigación se compone de 2 gemelos (niñas) univitelinas con discapacidad mental, con 11 años y 4 meses, frecuentadoras del nivel fundamental, en una escuela especial para niños con discapacidad mental. La evaluación motora utilizada fue los testes de la Escala de Desarollo Motor - EDM (Rosa Neto, 2002) y la evaluación cognitiva utilizó subtestes de la Escala de Inteligencia Wechsler para niños - WISC III (Wechsler, 2002) y una entrevista. **Resultados y conclusiones**: El nivel de desarrollo motor de los niños fue "muy inferior" (QMG abajo de 69). La estimación de QI de ambos fue “baja” (68). No hubo gran diferencia en el desarrollo cognitivo y motor entre la pareja. Se observó una relación directa entre la motricidad y la cognición, claves en el proceso de desarrollo general infantil.

Palabras clave: desarrollo motor, discapacidad mental, QI, gemelos.

DESENVOLVIMENTO MOTOR E COGNITIVO DE CRIANÇAS GÊMEAS COM DEFICIÊNCIA MENTAL
RESUMO

Introdução: A infância é uma fase da vida primordial para o desenvolvimento do ser humano, sob os aspectos cognitivo, psicológico, biológico e motor, pois nesse período ocorrem as principais maturações em seu organismo, sofrendo interferência direta do meio, especialmente gêmeos que convivem entre si. Crianças com deficiência mental apresentam um funcionamento intelectual significativamente abaixo da média, sendo geralmente diagnosticada na infância ou adolescência**.** **Objetivos:** avaliar e comparar o desenvolvimento motor e cognitivo de crianças gêmeas com deficiência mental. **Metodologia**: A amostra desta pesquisa foi composta por 2 crianças gêmeas univitelinas com deficiência mental (meninas), do sexo feminino, com 11 anos e 4 meses, freqüentadoras do ensino fundamental de uma escola especial. A avaliação motora utilizou testes da Escala de Desenvolvimento Motor EDM (Rosa Neto, 2002) e a avaliação cognitiva utilizou subtestes da Escala de Inteligência Wechsler para Crianças WISC III (Wechsler, 2002) e entrevista. **Resultados e conclusões**: O nível de desenvolvimento motor das crianças foi “muito inferior” (QMG abaixo de 69). O QI estimado de ambas foi baixo (68). Não houve grande diferença no desenvolvimento motor e cognitivo entre o par. Ficou evidente a relação direta entre motricidade e cognição, fundamentais no processo de desenvolvimento global infantil.

Palavras-chave: desenvolvimento motor, deficiência mental, QI, gêmeos.