07 - EVALUATION OF MOTOR AND COGNITIVE DEVELOPMENT OF CHILDREN WITH MENTAL RETARDATION

GECIELY MUNARETTO FOGAÇA DE ALMEIDA[1];
RACHEL SCHLINDWEIN-ZANINI[2]
[1] Master in Science of Human Movement. University of State Santa Catarina (UDESC/SC).
[2] Doctorate in Health Sciences (Neurosciences). Pontifical Catholic University of Rio Grande do Sul (PUC/RS). Post-doctorate in Psychology. University Federal of Santa Catarina (UFSC).
University of the State of Santa Catarina - UDESC
Center for Health Sciences and the Sport - CEFID
geciely@gmail.com

INTRODUCTION

The childhood is a stage of life of the human being paramount to their cognitive development, psychological, biological and motor, because during this period the main maturations occur in your body (COLE and COLE, 2003). Follow Cole and Cole (2003), early childhood (2-6 years), occurs explosive growth in the ability to understand and use the language. Children are moving with much more confidence and independence than even the 2 years of age. Already in the second childhood (7-10 years), there is an increase in physical and motor skills, featuring rapid progress in the ability to drive.

Papalia and Olds (2000) claim that the motor skills of children if the measure is perfect after these stages of development. For Rosa Neto (2002), the child development and learning are inextricably linked to movement, which is essential for the overall development of the child. A good motor control promotes proper exploitation of environments, from concrete experiences, which subsidize the development intellectual child.

Researchers like Wallon, Piaget, Le Boulch and Fonseca indicate the close link between the movement and the learning process of children. Fonseca (2004) says it is the interaction between two components that define human behavior: the movement and the psyche. To Wallon, the movement has a key role in affectivity and also in cognition, and is of extreme importance that joint understanding (GALVÃO, 2003).

Considering the motor activity as fundamental in the overall development of the child, because it makes children develop awareness of itself and the outside world, helping even in the achievement of its independence (ROSA NETO, 2002), it is understood the importance evaluation of motor used in children with mental retardation.

Mental retardation can be defined as the "intellectual functioning significantly below average (QI of approximately 70), starting before 18 years of age and concomitant deficits in adaptive functioning" (DSM-IV, 2006). The prevalence of disability is approximately 1% (DSM-IV, 2006), affecting up to 2% of children of school age (CURRY et al, 1997). In Brazil, 1.6% of the population presents this condition (IBGE, 2006).

To Lorenzini (2002), the development of the disabled child is very specific characteristics and changes in general will interfere directly in their ability to perform some activities. The disturbances associated that can be present in a mental retardation, such as sensory changes, problems and orthopedic, cardiac, respiratory, may interfere in purchasing power of these children. Given the interdependence of motor development and cognitive development, it is also the basis of the researchers, analyze and seek to understand this relationship in all types of people, such as children with mental retardation, a world still so little known.

Thus, the objective of this study was to evaluate the motor development and the cognitive development of children with mental retardation, seeking to discover the relationship between these two aspects of human development.

METHODOLOGY

This research is characterized as descriptive exploratory. The population consisted of 100 children from 06 to 11 years, regularly enrolled in a special school from 9 of the municipalities in the region of the Florianópolis/SC/Brazil.

The sample was composed by children from 06 to 11 years who were authorized by parents to participate in the search, which were randomly selected from each school 4 children, constituting the 32 children of the sample. It is worth noting that in 2 schools had only 2 students in that age group, so the number not reached 36 children. The instruments used for the evaluation be:

* Motor Assessment

It was used to Scale Development Motor (EDM), described in the Book of Motor Assessment (ROSA NETO, 2002), indicated for children from 03 to 11 years with learning difficulties in school, delays in the development cohort, problems with speech, in writing and in calculating, problems of conduct, neurological, mental and sensory disorders.

The EDM evaluates the following of the movement: fine motricity, global motricity, balance, scheme body, spatial organization, timing organization (language) and laterality. Through it is possible to obtain the ages motor and quotients motors of each child. The instrument used is the KIT EDM, composed of: Book, sheet of answers, tools for implementing and testing software.

The evaluation was performed by a motor physiotherapist, in the school environment, in a large room, bright and airy, with individually application (average 30 minutes).

* Cognitive Assessment

It used the Wechsler Intelligence Scale for Children - WISC-III (WECHSLER, 2002), indicated for individuals from 6 to 16 years. This scale allows obtaining the estimated QI of each child, through the application of 2 tests (cubes and vocabulary). The instrument used is composed of cubes, specific answer sheets and stopwatch.

The evaluation was performed by a cognitive psychologist, duly able to apply psychological tests. According to her, although there are several tests of intelligence, the best known is "Wechsler Intelligence Scale" representing the international gold-standard for the quantification of intellectual capacities (SCHLINDWEIN-ZANINI, 2007). The test was applied individually, with an average duration of 30 minutes.

STATISTICS

For the statistical processing was used SPSS software (APACHE, 2004). The exploratory analysis of the data was done by descriptive statistics, which were used for analysis: frequency, percentage, mean, variance, the standard deviation, minimum value, maximum value and median value. The test of correlation was used to linear correlation of Pearson.

RESULTS AND DISCUSSION

Genre: With regard to the gender of the sample measured, there was a discreet dominance of the male gender (n=17) on the female (n=15), corroborating with other searches (SOUZA, 1997, MARINELLO, 2001; ALMEIDA and ROSA NETO, 2006) that evaluated mentally handicapped. However, this difference was not statistically significant.

Age: With regard to age, 6 children were between 6 and 7 years, 8 children were from 8 to 9 years old and had 18 children between 10 and 11 years, and that the average age was 9 years and 3 months.

Laterality: With regard to laterality, 11 children were “dexterous”, 2 were "sinister", 3 had laterality "crusade" and 16 had laterality "indefinite", which can be considered a sign of warning.

Motor Development: The data collected in the motor assessment allow show that the difference between the average age of motor general (AMG=50) and the average chronological age (CA=118) is from 68 months (age negative), equaling approximately 5 years of motor deficit, a value that may be considered too high. The table 1 shows the statistical values of all variables of the motor development.

Table 1 - Motor development of the sample.

Variables	Mean	SD	Mininum	Maximun	Median
Chronological age (**CA**)	118	19,2	76	143	123
Age motor general (**AMG**)	50	12,8	22	80	51
Age negative (**AN**)	68	18,0	34	100	68
Age Fine Motricity (**AM1**)	46	15,7	24	84	48
Age Global Motricity (**AM2**)	48	22,0	24	96	48
Age Balance (**AM3**)	53	18,2	24	96	48
Age Scheme Body (**AM4**)	56	9,4	36	72	60
Age Spatial Organization (**AM5**)	57	16,1	24	96	60
Age Timing Organization (**AM6**)	39	20,2	0	72	42
Quotient Motor general (**QMG**)	43	10,1	25	65	44
Quotient Fine Motricity (**QM1**)	39	12,0	19	64	39
Quotient Global Motricity (**QM2**)	41	18,3	12	77	40
Quotient Balance (**QM3**)	45	15,1	17	77	46
Quotient Scheme Body (**QM4**)	48	9,5	25	65	48
Quotient Space Organization (**QM5**)	48	13,6	19	77	46
Quotient Language / Timing Organization (**QM6**)	33	17,1	0	65	33

For Table 1, you can see that the area of greatest deficit was the language / timing organization (QM6=33). Souza (1997), Marinello (2001), Almeida and Rosa Neto (2006), which researched children with mental disabilities, also found greater deficit in the area of language, stating the inter-relationship between the cognitive development and language, widely discussed topic authors classics like Piaget (1976). According to Piaget (1976), the development of language is connected to the construction of knowledge and intelligence.

Cognitive Development: All children evaluated had a cognitive development (IQ estimated) "deficit", as the scale of assessment used.

Relationship between motor and cognitive development: The data motor and cognitive have undergone the test of linear Pearson correlation, and that there was a positive correlation (r=0.6) between the values of QMG and QI estimated. This means that to the extent that increases the level of motor development increases the level of cognitive development.

CONCLUSION

The results found in this survey, conducted with children from 6 to 11 years diagnosed with mental retardation together with the literature review, it concluded that all children in the sample had a rating of the motor development "much lower" by the EDM and "deficit" by the WISC-III, confirming the results of other studies. Found was a positive correlation (r=0.6) between the values of QMG and QI estimated. This means that to the extent that increases the level of motor development increases the level of cognitive development, corroborating the literature and data from other research. Generally, children with mental retardation have a lower overall development compared with children without changes in development.

REFERENCES

ALMEIDA, G.M.F.; ROSA NETO, F. Motor evaluation and intervention in down Syndrome. **FIEP Bulletin**. 2006; 76: 413-416.

APACHE. Software Foundation. **Statistical Package For Social Sciences** - SPSS 14.0 for Windows. Copyright SPSS Inc. Release 13.0, 2004.

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.

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.

IBGE, 2006. **Instituto Brasileiro de Geografia e Estatística**. Censo demográfico 2000. Disponível em: <http://www.ibge.gov.br>. Acesso: Junho, 2006.

LORENZINI, M. **Brincando a brincadeira com a criança deficiente.** São Paulo: Manole, 2002.

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.

PAPALIA, D. e OLDS, S. W. **Desenvolvimento humano**. 7. ed. Porto Alegre: Artmed, 2000.

PIAGET, J. **A equilibração das estruturas cognitivas**: **problema central do desenvolvimento.** Rio de Janeiro: Zahar, 1976.

ROSA NETO, F. **Manual de avaliação motora.** Porto Alegre: Artmed, 2002.

SCHLINDWEIN-ZANINI, R. **Qualidade de vida da criança com epilepsia e de seu cuidador.** Tese (Doutorado em Clínica Médica e Ciências da Saúde - Faculdade de Medicina). 114 p. Porto Alegre: PUC/RS, 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.
WECHSLER, D. **WISC-III: Escala de Inteligência Wechsler para Crianças**. Manual. 3ª ed. São Paulo: Casa do Psicólogo, 2002.

Geciely Munaretto Fogaça de Almeida
R. Pastor Willian Richard Schisler, Filho, 980, ap.602.
Itacorubi - Florianópolis/SC/Brasil
CEP.: 88034-100
Tel: +55 (48) 9104-1250 - geciely@gmail.com

EVALUATION OF MOTOR AND COGNITIVE DEVELOPMENT OF CHILDREN WITH MENTAL RETARDATION

ABSTRACT

The aim of the study was to evaluate the motor and cognitive development of children with mental retardation. For both, were assessed 32 children from 6 to 11 years, belonging at 09 special schools in the region of Florianópolis/SC/Brazil. For the assessment of the motor development was used to Scale Development Motor-EDM (Rosa Neto, 2002), which assesses the fine motricity, global motricity, balance, scheme body, spatial organization, timing organization (language) and laterality. Through this scale, it is possible to obtain the Quotient General Motor (QMG) for each child, which is classified in 7 levels "much higher", "top", "normal high", "normal average," "normal low", " lower" and " much lower ". For the evaluation of cognitive development used to the Wechsler Intelligence Scale for Children- WISC-III (Wechsler, 2002), through tests of "cubes" and "vocabulary", and to get Quotient of Intelligence (QI) estimated for each child. The results found show that the motor development of children with mental retardation is "much lower" and the cognitive development is "deficit". Found is positive correlation between motor development and cognitive development (r=0.6), suggesting that by evaluating motor development can detect cognitive changes.

KEY WORDS: mental retardation; motor development; cognitive development.

ÉVALUATION DU DéVELOPPEMENT MOTEUR ET LE COGNITIF DES ENFANTS AYANT UN RETARD MENTAL

RÉSUMÉ

L'objectif de cette étude était d'évaluer le développement moteur et le cognitif des enfants ayant un retard mental. Pour les deux, ont été évaluées 32 enfants de 6 à 11 ans, appartenant à des écoles spéciales dans la région de Florianópolis/SC/Brésil. Pour l'évaluation du moteur développement a été utilisé pour le Développement Scalé Moteur - EDM (Rosa Neto, 2002), qui évalue l'amende : motricité globale, motricité finé, l'équilibre, le schéma corps, l'organisation spatiale, l´organisation calendrier (langage) et de la latéralité. Grâce à cette échelle, il est possible d'obtenir le Quotient de Moteur General (QMG) pour chaque enfant, qui sont classées en 7 niveaux "beaucoup plus élevé", "haut", "normale élevée", "moyenne normale", "faible normale", "faible" et "beaucoup plus bas." Pour l'évaluation du développement cognitif utilisé pour le Wechsler Intelligence Scale pour les enfants - WISC III (Wechsler, 2002), par le biais de tests de "cube" et "vocabulaire", et d'obtenir de Quotient Intelligence (QI) estimée pour chaque enfant. Les résultats trouvés montrent que le développement moteur des enfants ayant un retard mental est beaucoup plus faible et le développement cognitif est déficit. Est introuvable corrélation positive entre le développement moteur et le développement cognitif (r=0,6), ce qui suggère que l'évaluation par le développement moteur peut détecter les altérations cognitif.

MOTS CLES: retard mental; développement moteur; développement cognitif.

EVALUACIóN DEL DESARROLLO MOTOR Y COGNITIVO DE LOS NIñOS CON RETRASO MENTAL

RESUMEN

El objetivo de este estudio fue evaluar el desarrollo motor y cognitivo de los niños con retraso mental. Para tanto, se evaluaron 32 niños entre 6 y 11 años, pertenecientes a las escuelas especiales en la región de Florianópolis/SC/Brasil. Para la evaluación de lo desarrollo motor se utilizó la Escala de Desarrollo Motor - EDM (Rosa Neto, 2002), donde se evalúa la motricidad fina, motricidad amplia, el equilibrio, el esquema del cuerpo, la organización espacial, la organización temporal (lenguaje) y la lateralidad. A través de esta escala, es posible obtener el Cociente General Motor (QMG) por cada niño, que está clasificado en 7 niveles "mucho superior", "superior", "normal alto", "normal medio", "normal bajo", "inferior" y "mucho inferior". Para la evaluación del desarrollo cognitivo se ha utilizado la Escala Wechsler de Inteligencia para Niños - WISC-III (Wechsler, 2002), a través de pruebas de "cubos" y "vocabulario", y para conseguir el Cociente de Inteligencia (QI) estimado por cada niño. Los resultados encontrados muestran que el desarrollo motor de los niños con retraso mental es "mucho inferior", y el desarrollo cognitivo es el "déficit". Se encontró una correlación positiva entre el desarrollo motor y el desarrollo cognitivo (r=0,6), lo que sugiere que el desarrollo de la evaluación motora puede detectar cambios cognitivos.

PALABRAS CLAVE: retraso mental; desarrollo motor; desarrollo cognitivo.

AVALIAÇÃO DO DESENVOLVIMENTO MOTOR E COGNITIVO DE CRIANÇAS COM DEFICIÊNCIA MENTAL

RESUMO

O objetivo desta pesquisa foi avaliar o desenvolvimento motor e cognitivo de crianças com deficiência mental. Para tanto, foram avaliadas 32 crianças de 6 a 11 anos, pertencentes às 09 escolas especiais da região da Grande Florianópolis/SC. Para a avaliação do desenvolvimento motor foi utilizada a Escala de Desenvolvimento Motor - EDM (Rosa Neto, 2002), que avalia as áreas de motricidade fina, motricidade global, equilíbrio, esquema corporal, organização espacial, organização temporal e lateralidade. Através dessa escala, é possível obter o Quociente Motor Geral (QMG) de cada criança, que é classificado em 7 níveis: "*muito superior*", "*superior*", "*normal alto*", "*normal médio*", "*normal baixo*", "*inferior*" e "*muito inferior*". Para a avaliação do desenvolvimento cognitivo utilizou-se a Escala de Inteligência Wechsler para Crianças - WISC-III (Wechsler, 2002), através dos subtestes "cubos" e "vocabulário", sendo possível obter o Quociente de Inteligência (QI) estimado de cada criança. Os resultados encontrados mostram que o desenvolvimento motor de crianças com deficiência mental é "*muito inferior*" e o desenvolvimento cognitivo é "*deficitário*". Encontrou-se correlação positiva entre desenvolvimento motor e deficiência mental (r=0,6), sugerindo que através da avaliação motora é possível detectar alterações cognitivas.

PALAVRAS-CHAVE: deficiência mental; desenvolvimento motor; desenvolvimento cognitivo.