42 - PALMAR PREHENSION IN BEARERS OF MENTAL DEFICIENCY WITH AND WITHOUT DOWN'S SYNDROME

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Introduction

According to AAMR (American Association on Mental Retardation) and DSM-IV (Diagnostic and Statistical Manual of Mental Disorders), mental deficiency its understood by the status of notable reduction of the intellectual operation significantly inferior to the average, associated to limitations at least in two aspects of the adaptive work: communication, personal cares, domestic competences, social abilities, use of the community resources, autonomy, health and safety, school aptitudes, leisure and work (BALLONE, 2001).

According to the United Nations (UN), in Brazil there are approximately 15 million people bearers of deficiency (10% of the population). According to National Coordinating Office for Integration of the Person Bearer of Deficiency (CORDE), among these 10%, 5% of them are mental deficient (WERNER, 1997).

Bearers of mental deficiency have a very low level of strength and muscular resistance, hindering the accomplishment of the daily life tasks. The low level of muscular strength of that population is due to their lifestyle (FERNHALL, 1993).

The bearers of Down's Syndrome exhibit outstanding characteristics, which the muscular hypotony and the ligamentar laxity become evident, once they impede that the muscular force resultant of the activity of different muscular groups and joints be efficient to reach the expected result (htpp://ecof.org.br/projetos.down/artigos.htm).

However, there are few studies analyzing the characteristics of the muscular strength in individuals bearers of mental deficiency with and without Down's Syndrome.

For TELFORD (1984), the *society for all* should be conscious of the diversity of the human race and be structured to help to each citizen's needs, from majorities to minorities, from the privileged ones to those marginalized, and so, children, youths and adults with deficiency would be naturally incorporated to the inclusive society, defined by the principle: “all people have the same value”. So they would work together and with differentiated papers, sharing the same responsibilities for desired changes aiming to reach the common goodness.

The bearers of mental deficiency are probably the people more prejudiced, due to the overvalue of their intellectual abilities for the society (TELFORD, 1984; GLAT, 1989). While the bearers of physical deficiency and the bearers of sensorial deficiency are gradually integrated into the life's community, it still persists, in higher degree, prejudices in relation to those that have a mental deficiency (MARTINS, 1996).

However, with the sensibility process and understanding of the society, today with the beginning of the inclusion led mainly by the proposal of UN, (Resolution 45/91 of the General Assembly of 1990) seeking to build “a society for all” MARTINS (1996) and for the movement “inclusion international” GLAT (1988), the people who needs special educational are reaching their space in the society.

Inside the perspective of inclusion, the labor is a goal to be reached by that population. FERNHALL (1994) comments that the strength can be important for people with mental deficiency, because there is a strong relationship among performance in the work, level of independence and muscular strength in that population.

The practice of physical activity is not common in individuals with mental retard, with or without Down's Syndrome (FERNHALL, 1993; PITETTI *et al.*, 1992). As already described, besides the widespread muscular hipotony, outstanding characteristic in the population Down, its hand also presents several particularities and in spite of the vast available literature evaluating the palmar strength prehension normal population, it still lack studies comparing those data with the population bearing mental deficiency with and without Down's Syndrome.

The evaluation of palmar strength prehension is object of several studies, because it constitutes an important indicator in the analysis of the general state of the individual's strength, and it is essential for the accomplishment of the activities of daily life (AVD's) (BALOGUN *et al.*, 1991, MOREIRA *et al.*, 2001).

Thus, the problem that took us to develop this research it is characterized in the following way: it is necessary that studies are accomplished, evaluating the palmar strength prehension in individuals bearers of mental deficiency with and without Down's Syndrome (hypotonics), and these with normal individuals in the intention of indicating parameters, and consequently a scale of strength for individuals of this population, because there is a growing increase of the longevity in this population and lack of studies in this area.

Objective of the Study

To evaluate the palmar strength prehension in individuals of the masculine gender, bearers of mental deficiency with or without Down's Syndrome with age between 20 and 40 years and to correlate the obtained data with the normal population.

Methods

Study

It is a cross-sectional study design (PEREIRA, 1985).

Sample

The present study counted with 110 individuals' participation, distributed in three groups, which 40 formed the Control Group (GC), for not presenting mental deficiency, 30 to the group of mental deficiency bearers with Down's Syndrome (GSD) and 40 to the group of mental deficiency bearers without the referred Syndrome (GDM). Each group was constituted of masculine gender individuals, with age between 20 and 40 years, once this is the age with the most labor activity.

All individuals participated in the study in a voluntary way and were informed of the studies objective, procedures, possible discomforts, risks and benefits before signing (GC), or were authorized by their responsible, who signed (GSD and GDM) the Term of Free and Clarified Consent.

This work was submitted to the evaluation and approved for the Ethics Committee in Research, of the University of Brasília (UNB), according to Resolutions 196/96 and 251/97.

Instrument

The dynamometer JAMAR® (accurately in 1 Kg/f), consisting of a system of tension measures, constituted by two bars of steel that are linked together. For the measuring of the strength, the subject is guided to press the two bars with the

intention to approximate them. As the force is applied, it provokes an alteration in the resistance of the measurers that is directly proportional to the exercised force on the bars (DURWARD *et al.*, 2001).

The collection of the referring data to the palmar prehension was accomplished by the researcher with the adjusted dynamometer in the position 2 (extolled by SATM).

Before beginning the evaluation it was explained the purpose of the test, showing to the individual how to hold the device, with the objective to familiarize and adapt to the test outline. During the palmar strength prehension evaluation, the subjects were guided to be seated following the position standardized by SATM, which the hips and knees 90° flexed, shoulder adduced in neutral position, elbow 90° flexed and forearm in semi-pronation, without radial or ulnar deviation (MARTINS, 1996). It was ordered that the movement of palmar prehension to be made for each attempt after the examiner's verbal command (one, two, three, ready). There were a total of 3 attempts for each hand, beginning with the right and them the left, respecting interval of at least 1 minute for the same hand, with the intention of avoiding fatigue during the test. The force was applied for 5 seconds for each attempt (MOREIRA *et al.*, 2001).

Statistical analysis

The statistical package used was SPSS 12.0 for Windows. The statistical treatment considered was average, deviation-pattern, and variance analysis (ANOVA). The level of significance considered was $p < 0,05$.

Results

The table 1 portrays the average of age and deviation-pattern of the studied sample, where it is observed that these values are very close, because it was opted for the matching and they reflect the age group of larger labor activity of the population.

Table 1 - Individuals' distribution for group and average of age. Brasília, 2005.

Variables	Groups of Study		
	GC	GSD	GDM
N° of Individuals	40	30	40
Age (years)	27,00 ± 6,040	27,233 ± 6,120	27,025 ± 6,030

The table 2 demonstrates that the palmar strength prehension is significantly larger in function of the GC in relation to the GSD for the two hands and this presents difference of 20,83 Kg/f and 19,26 Kg/f for the hands right and left respectively.

Table 2 - Mean values and standard deviation for palmar prehension(Kg/f), differences of the mean values, percentile difference and variance analysis (Anova) of the averages of the measures collected between the Control Group and the group with Down's Syndrome. Brasília, 2005.

Variables	Mean ± DP(Kg/f)		Ä (Kg/f)	Ä %	p
	GC	GSD			
Right hand	43,52 ± 7,090	22,69 ± 4,560	20,83	47,86	0,000000001*
Left hand	40,36 ± 7,190	21,10 ± 3,700	19,26	47,72	0,000000001*

* Values statistically significant ($p < 0,05$)

The same difference is observed between the control group and the group of mental deficient without Down's Syndrome, being besides significant statistically, with differences of 8,12 Kg/f and 7,87 Kg/f in function of the group controls respectively for the right and left hand (table 3).

Table 3 Mean values and standard deviation for palmar prehension (Kg/f), differences of the mean values, percentile difference and variance analysis (Anova) of the averages of the measures collected between the control group and the group with mental deficiency. Brasília, 2005.

Variables	Mean ± DP(Kg/f)		Ä (Kg/f)	Ä %	p
	GC	GDM			
Right hand	43,52 ± 7,090	35,40 ± 6,520	8,12	18,65	0,000001*
Left hand	40,36 ± 7,190	32,49 ± 6,980	7,87	19,00	0,000004*

* Values statistically significant ($p < 0,05$)

In spite of, we also found significant differences for the palmar prehension strength in function of the right hand in relation to the left among the group of mental's deficient compared to the Down's group and these were 12,71 Kg/f and 11,39 Kg/f respectively (table 4).

Table 4 Mean values and standard deviation for palmar prehension (Kg/f), differences of the mean values, percentile difference and variance analysis (Anova) of the averages of the measures collected among the group Down and the Mental Deficient group. Brasília, 2005.

Variables	Mean ± DP(Kg/f)		Ä (Kg/f)	%	p
	GDM	GSD			
Right hand	35,40 ± 6,520	22,69 ± 4,560	12,71	35,90	0,0000002*
Left hand	32,49 ± 6,980	21,10 ± 3,700	11,39	35,05	0,0000001*

* Values statistically significant ($p < 0,05$)

The table 5 demonstrates that there is not statistically significant difference inside among the right and left hand of the groups studied.

Table 5 - medium Values and I divert pattern for force of palmar prehension (Kg/f), it differentiates of the medium values, it differentiates percentile of the measures and variance analysis (Anova) for right hand and left hand inside of the group. Brasília, 2005.

Groups	Mean values of the measures (Kg/f)		Ä (Kg/f)	Ä %	P
	Right hand	Left hand			
GC	43,52 ± 7,090	40,36 ± 7,190	3,16	7,26	0,051577**
GSD	22,69 ± 4,560	21,10 ± 3,700	1,59	7,00	0,144453**
GDM	35,40 ± 6,520	32,49 ± 6,980	2,91	8,22	0,057977**

* * Values not statistically significant ($p < 0,05$)

Discussion

The evaluation of the human muscular performance has been object of several studies, for identify deficiencies in the muscular strength and to supply objectives results for the effectiveness of the relative therapeutic procedures to the training of the function after offenses related to the muscle-skeletal system.

PITETTI (1993), comments that bearers of mental deficiency live under restrictions and limitations that should be overcome. Due to the differences in certain areas, many of them are still underestimated, mainly in relation to the sports, and for lack of cultural incentives and you adapt, that all the children should receive, they become inactive and sedentary people, and they go view in that way by the society

The average of age (years) observed in the studied groups it was of 27,00 ± 6,040 in GC; 27,233 ± 6,120 in GSD and 27,025 ± 6,030 in the GDM, width (20 to 40 years) characterizing a period of the life, where great part of the population is in great labor activity I (table 1). Besides, CROSBY *et al.* (1994) they concluded that the largest values for the prehension strength are obtained in the age group between the 20 and 40 years, being the dynamometer in the second position. With relationship to the average of the prehension strength obtained in the studied groups, it was observed that there was prevalence of the force in a significant way in the group GC in relation to the other groups (GSD and GDM) for both hands.

In the present study, it is tried to settle down parameters to favor the analysis of the data, minimizing gauging inclinations and selection (PEREIRA, 1985). This way a researcher was just responsible for the acquisition of the data of the palmar prehension strength. Still, in the sense of minimizing possible inclinations, a pilot study was accomplished with the individuals that formed GSD and GDM to identify if they understood the verbal command to print force in the device. It is believed that has not had simulation on the part of these individuals, because these results repeated during the definitive acquisition of the data.

Our results demonstrated significant differences among the force of palmar prehension in the studied groups when compared the group it controls in relation to the Down's group (table 2); the group control in relation to the Mental Deficient group (table 3) and also when compared the Mental Deficient group in relation to the group Down (table 4). This way, in relation to the palmar prehension strength, according to the results, the study reinforced that the sedentariness, peculiar to the studied population, has a great effect in the muscular strength, having differences statistically significant in the group of mental deficiency bearers with and without Down's Syndrome in relation to the control group.

These results suggest that the physical inactivity, observed in the population of mental deficiency with and without Down's Syndrome causes important deficit in the strength and that the widespread muscular hipotony, characteristic genetics of the population Down, is still responsible for generating significant difference in the prehensive strength among individuals of these two groups, which in the group to contemplate on the serious impact of these differences in the accomplishment of the life daily activities and work opportunities in these populations. These discoveries indicate that the decrease of the muscular tonus, associated to the ligamentar laxity is outstanding and significant in function of GSD and as the palmar prehension strength is indicative of the general force of the body (DURWARD *et al.*, 2001), this is significantly smaller in individuals bearers of the Down's Syndrome.

Study accomplished by PITETTI *et al.* (1992) confirms this discovery, in the sense of they have found reduced force in the population Down in relation to normal population and a significant relationship between hipotony and deficit of strength.

Normative data for the palmar prehension strength in the normal population found by BOWEN, *et al.* (2001) using methodology also proposed by healthy SATM of 43,06 Kg/f for the masculine sex. These data are equivalent with found them in this study (43,52Kg/f). GODOY, *et al.* (2005) found value of 21,36 Kg/f with similar sample for men in the population Down that are also equivalent to the found in this research (22,69 Kg/f). They were not found referring data to the population of Mental Deficient for comparison.

When we considered the percentile difference of the palmar prehension strength among the right and left hand (table 5), in spite of terms in our sample 3 sinister in each group, we observed that this in GC is of 7,26%, in GSD the percentile difference is of 7,00% and for GDM it is of 8,22%, values these not statistically significant. Results of the literature rotate around 10% in the men (CROSBY *et al.*, 1994; CAPORRINO *et al.*, 1998), and for the sinister people, there usually is not difference in the prehensive strength among the two hands. MOREIRA *et al.* (2001), tell that there is not prevalence of the strength in relation to the pattern of dominance of the hand, and they speculate that the right hand is stronger than the left in the individuals' function to have to adapt to live in an organized society for skillful people.

The accomplishment of this study demonstrated that is important to stimulate the practice of physical activity among the mental deficiency bearers with and without Down's Syndrome, seeking improvement of the life quality and consequent acting of the activities of daily life.

It is necessary that to the mental deficient, with and without Down's Syndrome be offers the chance of a complete citizenship, that start to consider them potentially as people capable to reach social and political independence and that are rewarded economically by the that you/they are capable to produce.

Final considerations

Based in the results of the analysis grip strength palmar prehension with the use of JAMAR® dynamometer in the group GE compared with group GSD and GDM in Federal District in relation to the obtained results and the discoveries described in the literature, it can be ended that:

· A prevalence of palmar prehension strength exists in function of the right hand in relation to the left in the studied groups;

· Deficit of palmar prehension strength in significant way of the group was verified GE compared with the group GSD and GDM;

· The obtained results should be considered as indicative of strength for the training the manual function of the bearer of Mental Deficiency and Bearer of Down's Syndrome.

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PALMAR PREHENSION IN BEARERS OF MENTAL DEFICIENCY WITH AND WITHOUT DOWN'S SYNDROME

SUMMARY

This study had as objective evaluates the palmar prehension strength in individuals of the masculine gender, bearers of mental deficiency with or without Down's Syndrome with age between 20 and 40 years old and to correlate the data obtained with the normal population, seeking to indicate parameters, and a scale of force for bearers of Down's Syndrome. It is a cross-sectional study design that counted with the participation of 110 individuals', divided in three groups: Control Group (GC) = 40 (normal individuals), Group bearer of Down's Syndrome (GSD) = 30 and the Group with Mental Deficiency not associated to syndrome (GDM) = 40. The prehension strength was verified with the JAMAR dynamometer. The GSD presented values significantly smaller than the GDM, both smaller in relation to the GC; the obtained data should be considered as indicative of strength for the training of the manual function of the bearer of Mental Deficiency and Bearer of Down's Syndrome.

Key-words: 1. Mental Deficiency, 2. Down's Syndrome, 3. Palmar Prehension.

PRÉHENSION PALMAIRE DANS PORTEURS DE MENTAL DÉFECTUEUX AVEC ET SANS LE SYNDROME DE DOWN

RÉSUMÉ

Cette étude eue comme objectif évalue la force de préhension palmaire des individus du sexe masculin, porteurs du Mental Défectueux avec ou sans Syndrome de Down avec âge compris entre 20 et 40 années et correspondre le données obtenu avec la population normale, en cherchant pour indiquer des paramètres, et une échelle de force pour porteurs du Syndrome. C'est une étude de traverse caractère analytique qu'il a compté avec la participation des 110 individus, a distribué dans trois groupes: Groupe Controle (GC) = 40 (individus normaux), je Groupe porteur du Syndrome de Down (GSD) = 30 et le Groupe avec Mental Défectueux n'ont pas associé à syndrome (GDM) = 40. Le dinamomètre JAMAR la force du préhension a été vérifiée. GSD a présenté des valeurs considérablement plus petit que GDM, les deux plus petits par rapport à GC; les résultats obtenus devraient être considérés comme indicatif de force pour la formation de la fonction manuelle du porteur du Mental Défectueux et porteur de Syndrome de Down.

Mots-clés: 1. Mental Défectueux, 2. Syndrome de Down, 3. Préhension Palmaire.

PRENSIÓN PALMAR EN PORTADORES DE DEFICIENCIA MENTAL CON Y SIN LA SÍNDROME DE DOWN

RESUMEN

Este estudio tenido como el objetivo evalúa la fuerza de palmar del preensão en los individuos del sexo masculino, portadores de deficiencia mental con o sin el Síndrome de Abajo con edad entendida entre 20 y 40 años y para poner en correlación los datos obtenidos con la población normal, mientras buscando indicar los parámetros, y una balanza de fuerza para portadores del Síndrome de Abajo. Es un estudio de carácter analítico atravesado que estaba con la participación de los 110 individuos, distribuído en tres grupos: Grupo Controle (GC) = 40 (los individuos normales), yo me Agrupo a portador del Síndrome de Abajo (GSD) = 30 y el Grupo con Mentral Deficiente no asociaron al síndrome (GDM) = 40. Con el dinamômetro JAMAR la fuerza de prehensión fue verificada. GSD presentó los valores significativamente más pequeño que GDM, ambos más pequeños con respecto al GC; los resultados obtenidos deben ser considerados como indicativo de fuerza para el entrenamiento de la función manual del portador de deficiencia mental y Portador de Síndrome de Down.

Las palabras codifican: 1. Deficiencia Mental, 2. Síndrome de Down, 3. Prehensión Palmar.

PREENSÃO PALMAR EM PORTADORES DE DEFICIÊNCIA MENTAL COM E SEM SÍNDROME DE DOWN

RESUMO

Este estudo teve como objetivo avaliar a força de preensão palmar em indivíduos do sexo masculino, portadores de deficiência mental com ou sem Síndrome de Down com idade compreendida entre 20 e 40 anos e correlacionar os dados obtidos com a população normal, visando indicar parâmetros, e uma escala de força para portadores da Síndrome de Down. Trata-se de um estudo de caráter analítico transversal que contou com a participação de 110 indivíduos, distribuídos em três grupos: Grupo Controle (GC) = 40 (indivíduos normais), Grupo portador da Síndrome de Down (GSD) = 30 e o Grupo com Deficiente Mental não associada a síndrome (GDM) = 40. Com o dinamômetro JAMAR, verificou-se a força de preensão. GSD apresentou valores significativamente menores que GDM, ambos menores em relação à GC; os resultados obtidos devem ser considerados como indicativo de força para a capacitação da função manual do portador de Deficiência Mental e Portador de Síndrome de Down.

Palavras chave: Deficiência mental, Síndrome de Down, preensão palmar.