INTRODUCTION

The incidence of postural problems in children and adolescents has been growing strongly in the last years. The postural alterations that occur during the growth phases and development of these youngsters can be considered as some of the factors predisponentes to degenerative conditions of the column when adult. According to Asher (1976), most of the postural problems originates in the childhood, mainly the ones related with the spine, caused by traumas, emotional and social factors and of hereditary order.

In the late childhood considered by Eckert (1993), as the period from 6 to 10 years of age, the child can spend most of its energy for the improvement of the basic patterns of movement established in this period, because the sizes and proportions of the body develop slow and gradually, and a relationship almost constant is maintained in the bony development and tissue. In agreement with Bee (1997), patterns and habits established in this period cannot just affect the experience in the adolescence, but also the adult life, as the acquisition of inadequate postural habits.

When relating school and posture, several problems are observed as ergonomic difficulties in the transport of school material and disposition and inadequate proportions of the accessories. In spite of the concern and discussion concerning these factors by professionals of the area, children and adolescents continue using the same knapsack, may be due to a lack of anthropometrics and biomechanics data about its risks. Santos et al (2001), they observed significant difference in the vertical force and temporary characteristics, cadence and speed did not present significant difference between gait with and without knapsack, what corroborates the capacity of adaptation of the organism. They reinforce the importance of the Physical Education in school as well as the creation of programs about exercises for prevention of the postural aches, and also the parents' understanding of the importance to take care with the load transported in the knapsack.

Although the relevance about the seriousness of the theme, nobody is doing something to solve it. In Mota et al (2002) studies, they found that use school backpack, type two loop, with load at 12% of the body mass in children with 8 and 9 years old, exercises influence in the behavior of the hip and trunk angles during the gait. Otherwise, the space and temporary characteristics, cadence and speed did not present significant difference between gait with and without knapsack, what corroborates the capacity of adaptation of the organism. They reinforce the importance of the Physical Education in school as well as the creation of programs about exercises for prevention of the postural aches, and also the parents' understanding of the importance to take care with the load transported in the knapsack.

METHODS

The sample was chosen intentionally and composed by eight children (five girls and three boys), at the average of 10 years old, average height of 1.43 meters and body mass average of 36.4 kg, who use school knapsack everyday. Either the parents or the legally responsible for the children signed a consent term about the proceedings of the study.

Two cameras with frequency of 60 Hz were used for data gathering, three attempts were filmed for the execution of a complete gait cycle, at free speed, without overload and with overload of 8% (first situation – S1), 12% (second situation – S2) and 16% (third situation – S3) of the body mass. For data acquisition related to the angles, the left and right side of the body were filmed separately and identified by external landmarks in the both side of the body (glenohumeral joint, anterior superior spine, greater trocanter of the hip, epicondyle of the humerus, lateral maleolo and the second metatarsal bone). The children wore swim suit to easier the placement of the landmarks.

The backpack used was the one of the type knapsack, and all the subjects used the same one. The option for the knapsack type was due to the model being the one more used according to the interview. The interview was done with 81 children, of which 43% transported backpack of the type knapsack, 34 % used backpack with wheels, 13 % used briefcase with a handle, 5 % used briefcase with a loop and 3 % used briefcase without loop. From the children that used backpack with 2 loops, 60% mentioned pains on the cervical area, shoulders and pectoral.

The data were processed by Peak Motus® system , and a Butterworth filter was used at a cut frequency of 60 Hz. The data were normality checked through Shapiro Wilk test. The angular displacement pattern was compared using ANOVA test, at each 10% of the cycle. When a significant statistical difference was found, the Turkey test was used, and the significance level was set at p<0.05.

RESULTS AND DISCUSSION

The analyses of the trunk displacement angle related to the vertical, to gait carrying the backpack, showed a greater front inclination than the normal, with significant statistical difference (p<0,05), when compare 0% of the cycle, without the knapsack and in situation S2 and S3, in 10% and 20% of the cycle when compare a gait without knapsack with S2, and in 90% and 100%, when compare the gait without knapsack with S1, S2 and S3.
The behavior of the angle of the hip, characterized by the maximum extension in the contact of the opposite foot and for a maximum flexion in the terminal swinging phase according to Sutherland et al (1998), it presented a larger flexion degree, identified by significative statistical difference (p <0.05), when comparing the instants of 0%, 90% and 100% of the cycle, for the gait without knapsack in relation to S2 and S3 and, again at 10% of the cycle in relation to S3, what can be an effect of the compensatory posture of the trunk.

The results of this study show that overloads smaller than the ones suggested by Hong & Cheung (2002), can exercise effects on the posture of the trunk.

Related to the behavior of the knee and ankle angle, no significative statistical difference was identified (p<0.05).

The angular displacement pattern and its values were similar to the one found in the literature (David, 2000).

CONCLUSIONS

The results of this study, point out to an expressive increase of trunk frontal inclination, which reflect in the hip angular movement, when loads in the knapsack were used, related to 8, 12 and 16% of the person’s body mass.

Although of the control strategies and protection of the body structures and the spine in the situations of load support, the damages, under the mechanical aspect to a child’s organism in growing phase, cause harmful functional reactions to the corporal alignment and the mobility to articulate.

REFERENCES


