

Clinical Application of Dynamic Gait Index-Brazilian Brief Version

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Abstract

Introduction: On senescence the gait gets worse and affects functional capacity of the elderly and, compromises independence, autonomy and increases the rates of falls in this population. The evaluation and the study of the prevalence for future falls allow the development of preventive strategies.

Objective: To analyze the results of the application of the Dynamic Gait Index (DGI) Brazilian brief proposal and establish correlation with the original version.

Methods: Study approved by the Ethics and Research Committee of the institution under number 0197.0.107000.09. We analyzed 223 files of socially active elderly, female gender, aged ranged 60 to 85 years, mean 68.54 (\pm 7,61) years. The volunteers were evaluated by the DGI- Brazil. For the statistical analysis, the Pearson Correlation Momentum Correlation Test with Spearman Correlation was used, with $P < 0.5$ and $R = 1,0$.

Results: Sixty-three (27.8%) of the volunteers presented an altered DGI scores. The statistical analysis indicated that T1 and T2 did not contribute to decrease the total score in the test. The worst performances occurred in Tasks 3, 5 and 6. There was founded a positive correlation between tasks 1 and 2; 1 and 8; 3 and 4; 3 and 5; 4 and 5; 2 and 4; 2 and 7. Negative correlation occurred between tasks 4 and 8, and 6 was not correlated with another Task.

Conclusion: The DGI-Brazilian brief version presented a strong correlation with the original proposal and may be perfectly applicable in clinical practice as a tool to evidence future risks of falls in the elderly people.

Keywords: Aged; Postural balance; Accidental falls; Clinical protocols

Introduction

As knowledge it is necessary identify the needs and facilities to access the health services, the different diseases parameters; the educational and preventive measures to demand the health cares of the elderly population that increased significant in last years in the world. Indicators for risk of falls as gait could deteriorate affecting the capacity and functional autonomy and impacting negatively the quality of life. There are differences in gait efficiency that are related to the life cycles, it is noted that it reaches its maximum efficiency at the end of childhood and declines progressively over the years with senescence. The gait gets worse and affects functional capacity of the elderly and, compromises independence, autonomy and increases the rates of falls in this population. To evaluate the gait, the Dynamic Gait Index (DGI) [1] was suggested to document the patient's ability to change gait in response to changes in their eight tasks. The DGI was validated in Brazil in 2016. Based on the premise that each task of the DGI could change the final score of the test, the objective of this study was to

analyze the results of the application of the Dynamic Gait Index-Brazilian brief proposal and establish correlation with the original version.

Methodology

Retrospective, descriptive and qualitative study approved by the Ethics and Research Committee of the institution under number 0197.0.107000.09. We analyzed 223 patient files with evaluations of socially active elderly, the female gender, aged ranged 60 to 85 years, resident on five towns of Sergipe state on northwest of Brazil. Besides the age over than 60 years, the inclusion criteria verified the ability to respond to the commands of the DGI and to perform the evaluation sequences. Those with impaired verbal comprehension, motor and locomotion difficulties, visual and auditory deficiency, degenerative neurological diseases and treated with psychotropic drugs were excluded. To evaluate balance and gait, the Dynamic Gait Index-Brazil (DGI) [2] was used to identify future risk of falls. In the first stage of the study, all subjects who presented risks for falls were identified from the analysis of the data base. Through the identification of the volunteers with risk of falls ($n=63$) the study of possible correlations

between the performance between the tasks and each one of them and the result of the general performance in the DGI with the original version was carried out. It was hypothesized that each task would contribute with greater or lesser influence on the final scores that would list the more sensitive to identify risks of falls. From the exclusion of tasks 1; 2 and 7 were defined the parameters of the reduced DGI-Brazilian composed of five (5) tasks and cut point equal or less than 11. In the second draft of the study, the volunteers with risks for falls were identified by DGI-Brazilian brief version and the possible correlations between the two versions were established. For the statistical analysis we studied the dependent variable the response of each volunteer in the DGI, the total scores in each version and the independent variable was the full performance in each task. The software used was the SOFT R PROJECT: 3.12 and the descriptive measures, the Pearson Correlation Moment Product Coefficient test ($p < 0.5$), the Chi-square test and the Pearson Correlation Matrix ($R = 1.0$) were used.

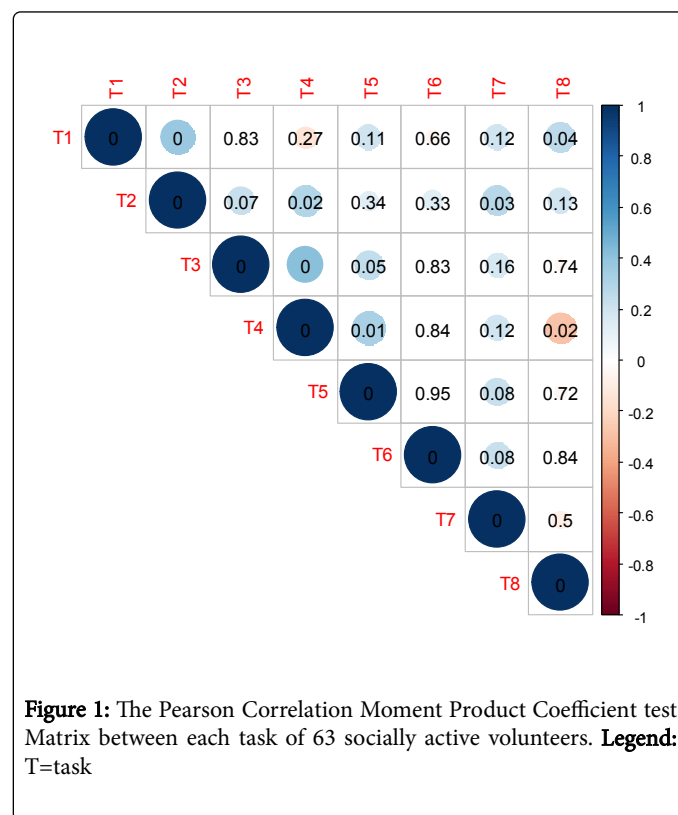
Results and Discussion

By the DGI in its original version it was possible to identified 63 (28.0%) chart that presented score equal to or less than 19 points which indicated a future risk for falls. The mean age of this sample was 68.54 (± 7.61) years. The Pearson Correlation Moment Product Coefficient test between each task showed a positive correlation between T1 (gait level surface) and T2 (change in gait speed) ($p = 0.37$); T1 (gait level surface) with T8 (Rise and descend steps) ($p = 0.26$); T3 (gait with horizontal head turns) with T4 (gait with vertical head turns) ($p = 0.42$); T3 (gait with horizontal head turns) of the head) with T5 (gait and pivot turn) ($p = 0.25$); T4 (gait with vertical head turns) with T5 (gait and pivot turn) ($p = 0.33$); T2 (change in gait speed) with T4 (gait with vertical head turns) ($p = 0.30$) and with T7 (step around obstacles) ($p = 0.20$). There was a negative correlation between T4 (gait with vertical head turns) with T8 (steps) ($P = -0.29$), and T6 (step over obstacle) was not correlated with any task. Statistical analysis indicated that T1, T2 and T7 did not contribute to decrease the total score in the test and that the worst performances occurred in Tasks 3, 5 and 6. These results pointed five tasks were more sensitive to identify risk of falls and allowed to infer that some tasks can be suppressed because they evaluate similar constructs, despite their particularities, and from where the DGI-Brazil Brief (Figure 1).

At second phase of the study, the 223 patient's records were revised by the proposal of the Brazilian DGI-brief. Statistical date suggested a cut grade equal or less than 11 points. It was possible identified 65 (29.1%) volunteers with risk for falls. It is noteworthy that 57 (90.5%) volunteers were considered within the risk parameters in the both versions of the DGI; Six (9.5%) who were at risk in the original version came out of this condition in the brief version and eight (12.6%) who were not at risk in the original version became in this status on the reduced version. The Chi-square test revealed no significant correlation ($p = 0.91$) between the two versions, which allowed to infer that the reduced version can be used for clinical proposal, but revealed a strong correlation on both version ($R = 1.0$).

The positive correlations verified in the comparison of the tasks on two tools can be explained by evaluating similar functional bases, as well as the tasks that presented negative correlations, since they evaluate different attributes. One example with high correlation it was founded between tasks 3 and 4, in which the patient moves from one point to another with head movement, ranging horizontal to vertical direction. Tasks 4 and 8 were negatively correlated because they were

very different activities and needed singular and greater postural control.



Mainly the results pointed that a significant percentage of the volunteers evaluated presented risks for falls, emphasizing that even though they were socially active, they presented a risk for future falls. The important fact that needs to be highlighted is the increase in the elderly population of the world causing an urgent need for the development of preventive strategies. The Dynamic Gait Index-Brazil showed a high internal consistency between its tasks and could be a reliable instrument [2,3]. There is a correlation between body balance; functional capacity, risk and prevalence for falls in patients with chronic vestibular dysfunction that pointed out a positive correlation with the functional capacity and balance and negative correlation with risk for falls [4]. A study noticed that there was influence of the cognitive function on the final scores of the DGI, and it revealed there was no relation between risk for falls and quality of life in socially active elderly [5,6]. Some studies [7,8] showed that gait was associated with loss of strength and muscles elasticity, postural changes, reduced mobility, poor related self-perception of health, depression, anxiety, prescription of medications, decreased vision, and order issues social and environmental issues.

The presented results were agreed with other studies [9-11]. Of the eight tasks that compose the DGI, five were more sensitive to identify risk of falls and contributed more weight to the final score of the test. Although simple, DGI has a high predictive value for falls risk2. The suggestion of a brief version was discarded in a study [12] that showed that all asks of the DGI need to keep as in original, which was disagreed with the presented results. By its clinical applicability and solid results in based scientific evidence, the results statistically indicate that the use brief instrument is agreement with other studies [13,14] that suggested the importance of sensitive, reliable and fast

applicability tools for postural control evaluation. We are agreed with the proposal the balance evaluation with protocols is a simplest way to verify everyone's ability to control the balance and to identify those who are likely to fall. The DGI is a reliability and excellent predictive protocol for risk of falls to apply on the elderly [9].

Conclusion

The DGI-Brazilian brief version presented a strong correlation with the original proposal and may be perfectly applicable in clinical practice as a tool to evidence future risks of falls in the elderly people.

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