

# The risk of falling associated to dizziness in elderly

## Abstract

The aging process can be understood as a natural process of the progressive decreasing of the functional individuals reserve. As cause from this degenerative process it occurs vertigo and / or dizziness and body imbalance associated with the risk of falls, what brings impacts to the daily life of the elderly like a reduction of social autonomy, reduction of daily activities, insecurity, suffering and immobility. The dizziness are frequent in all age groups, especially in the elderly because of the body systems functions decreasing as a whole and in particular the body system balance, which includes the integration of vestibular, visual and proprioceptive sensors. According to the type of injury, the individual can have the vestibular rehabilitation as treatment suggested and it can be performed by speech therapists and physiotherapists. The Vestibular Rehabilitation Therapy (TRV) is a non-invasive treatment, consisting of specific repetitive physical exercises associated with medication when in need as well as lifestyle and diet changes. The techniques used are based on habituation and substitution exercises that involve cephalic movements on different speeds and surfaces to promote the plasticity of the vestibular system and activation of the deep proprioceptors of the foot sole that are responsible for the vibratory sensitivity. Vestibular rehabilitation has been shown like an important method in the treatment of patients with balance disorders, improving their competence and well being in performing daily activities.

**Keywords:** aging, postural balance, vestibule, labyrinth, dizziness

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**Abbreviations:** TRV, vestibular rehabilitation therapy; QOL, quality of life; VR, vestibular rehabilitation

## Introduction

### Aging process

Before the aging has been considered as a phenomenon, nowadays it is part of the most societies reality. The world is getting old. It is so true that it is estimated, that there will be about 2 billion people with more than 70 years old in the world in 2050 and most of them will be living in developing countries.<sup>1</sup>

The aging process can be seen as a natural process of progressive decrease of the functional reserve of the individuals. (Senescence) which, under normal conditions, does not usually cause any problem. However, under conditions of overload such as diseases, accidents and emotional stress can cause a pathological condition that requires assistance – Senility.<sup>2</sup>

The central nervous system from the aging process suffers damages when accomplishes the processing of the vestibular, visual and proprioceptive information that are responsible for the balance maintenance and reducing the ability to modify the adaptive reflexes. As cause of this degenerative process, it occurs vertigo and/or dizziness and imbalances in the elderly population.<sup>3</sup>

The aging of the world's population is an undeniable fact. There is a totally agreement that the pace of this process in next decades will be particularly fast in developing countries.<sup>4</sup> It is an extremely complex phenomenon caused by many factors, which produces the most diverse trends and consequences. That's why this phenomenon is demanding more and more multidisciplinary studies for its better understanding and comprehension.<sup>5</sup>

As a consequence of this process, researchers, Veras,<sup>6</sup> report that the area of aging has become a priority in the training of qualified

professionals, in research and development of health models. Taking Care properly of the multiple elderly demands is a social issue, and it concerns to all, it is an adversity, something indispensable in the contemporary multiprofessional health discussion agendas in this century.

The imbalance disorders bring big impacts to the daily elderly life, it leads to a reduction of social autonomy which has as consequences: The reduction of daily activities, unsafe feelings and predisposed to falls, it induces to suffering and body immobility.<sup>3,7,8</sup>

### Dizziness and risks of falls

Dizziness is common in every age range, especially in elderly people because of the body system functions wane as a whole. In particular the balance body system that includes the connection of vestibular, visual and proprioceptive sensors.<sup>9</sup> Among all Vestibular symptoms, dizziness is the most common, after 65 years, it directly interferes with quality of life (QOL) and It is also the second major symptom that prevails in the world population until the age of 65, it loses only to migraine.<sup>10</sup> Age is directly associated with changes in gait and equilibrium and consequently related to the risks of falls especially in the female gender due to bigger longevity than the male gender.<sup>11,12</sup>

Dizziness is the illusion of movement.<sup>9,13</sup> Authors describe that the most common manifestations are the spinning sensations of a person's surroundings, instability, disequilibrium, fluctuation, spatial disorientation and drunkenness. They can be like a rotating type (vertigo) or non-rotatory type (instability, fluctuation, oscillations), imbalance and visual distortion with feeling of going forward or backwards (oscillopsia).<sup>10</sup> This imbalance is one of the main risk factors for falling and restriction on the elderly's life.<sup>14</sup>

In another study, Authors said that: The potential severity of balance disorders in the elderly give to prevention a privileged place,

because a falling can be considered a sentinel event in an elderly person's life, it is a potential spot in the beginning of an important functional decline or a symptom of a new pathology, because of the loss of body capacities (Peres e Silveira<sup>15,1</sup>

Falling is defined as an unintentional event that has as a result of an individual initial position in change to the same level or a lower level.<sup>16</sup> Besides, falling represents a big problem for old people because of its consequences (insult, incapacity, institutionalization and death) these are the effects of the combination between high incidence and high susceptibility to injuries (BRASIL, 2007). About 30% of older people fall every year. This rate increases to 40% among the elderly with more than 80years old and 50% Women tend to fall more than men up to 75years old, from this age the frequencies are the same.<sup>1</sup>

The same author cited previously, also describes that elderly who fall, about 2.5% need hospitalization and from this percentage, only half will survive after one year. The most common causes and risk factors associated with falls to elderly in the community are: the environment, equilibrium / gait weakness / disturbances, dizziness / vertigo, postural modification / orthostatic hypotension, central nervous system injury, syncope, and reduction of vision.

### Vestibular rehabilitation

According to the type of injury, the person can have as indicated, the vestibular rehabilitation treatment and it can be made for speech therapists or physiotherapists. The patient when taken to their offices must be evaluated as a whole. mainly in their auditory, postural and functional disabilities.<sup>17</sup>

Vestibular Rehabilitation therapy (TRV) is a non-invasive treatment, consisting of specific and repetitive physical exercises associated to a prescription as needed as well of changes of lifestyle and diet. It is based on the neural plasticity from the central nervous system for the regulation and maintenance of balance. Through: Adaptation, habituation and substitution.<sup>14,18</sup> The balance system integration is processed in the vestibular nucleus of the brainstem, when it is receiving sensory information the central nervous system triggers ocular and spinal reflexes for automatic and unconscious maintenance of the body equilibrium.<sup>19</sup>

In adaptation, the vestibular system learns how to receive and process information, even if distorted or incomplete, then it re-establishes the body balance. The habituation consists in the reduction of sensory responses through repetitive exercises. In the substitution process the central nervous system is able to replace information from the deficient vestibular function with the goal of recovering the visual field stability.<sup>19,20</sup>

The TRV has the objective of re-establishing or minimize the body balance disorders and provide a better life quality and the individual's functionalities.<sup>21</sup> The techniques used are based on habituation and substitution exercises that involves the cephalic movements, in different speeds and surfaces, to promote the plasticity of the vestibular system and activation of the deep proprioceptors on the sole(bottom of feet) responsible for the vibratory sensitivity.<sup>17</sup> The Vestibular rehabilitation (VR) exercises intend to improve vestibulo-visual interaction during the cephalic movement, increase static and dynamic postural stability in conditions which produces conflicting sensory information and decreases the individual sensibility to cephalic movement.<sup>22</sup>

In a study based on a literature review about VR exercises benefits,<sup>23</sup> the writers observed, based on their articles researches,

the great success of Vestibular Rehabilitation in elderly with Dizziness problem. The vestibular Rehabilitation brought a positive psychological effect in recovery of physical and mental safety and then the improvement of elderly life quality.

Therefore, it is noticed that an effective evaluation associated to a structured program of phonoaudiological vestibular rehabilitation contribute to a significant improvement in the symptomatology of dizziness, general quality of life and physical, emotional and functional elderly's abilities. Then this tool has been shown important in the treatment of patients with balance disorders, improving their competences and well being in performing daily activities.

<sup>1</sup> Translated from: "A gravidade potencial dos distúrbios do equilíbrio nos idosos confere à prevenção um lugar privilegiado, porque uma queda pode ser considerada um evento sentinela na vida de uma pessoa idosa, um marcador potencial do início de um importante declínio funcional ou um sintoma de uma patologia nova, em razão da perda de capacidades do corpo" (Peres e Silveira, 2010).

### Conclusion

Therefore, the aging is a natural process that brings some physiological features like vertigo and /or dizziness and Body disequilibrium that are the main causes of falls in this group of people. However, using a structured program of vestibular rehabilitation associated with some medicine, when it is necessary, as well as changes in living and eating habits, it is possible to have a significant improvement in the symptomatology of dizziness, general quality of life and physical, emotional and functional elderly's abilities. This tool has been shown important in the treatment of patients with balance disorders, improving their competences and well being in performing daily activities.

### Conflicts of interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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