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Postural stability in people with a visual impairment: a cross-sectional study

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Introduction: Vision has a crucial role in stability maintenance. It is thought that people with a visual impairment (VI) can compensate their loss of vision with their other senses. However, there is a controversy in this regard. Our aim was to verify if there is a real compensation for the control of postural stability depending on the age of VI acquisition.

Methods: In this cross-sectional study, 29 subjects with a VI were recruited and were classified into two groups, depending on their age of onset blindness: early onset blindness (EB) (n=15) and late onset blindness (LB) (n=14). They were compared with a group of 17 age and sex matched individuals. Standing on a pressure platform, we measured COP velocity, COP displacement and sway area during quiet stance. Participants had to stand barefoot in bipedal and in unipedal stance in open and closed eyes conditions.

Results: in bipedal stance, EB subjects showed a greater COP displacement and COP velocity ($p \leq 0.05$) than sighted controls in eyes open condition. LB individuals and their sighted counterparts exhibited a greater COP velocity and COP displacement in bipedal stance when their eyes were closed ($p \leq 0.05$). Overall, participants with a VI have a worse postural stability than sighted subjects in unipedal stance ($p \leq 0.05$).

Conclusions: EB individuals could not fully compensate their loss of vision for the control of their postural stability. Rather, the postural stability of LB subjects seems to be more similar to those sighted subjects, as the postural stability of both groups is better in bipedal stance when their eyes were open.

Biography

Mónica-Alba Ahulló-Fuster has her expertise in the field of neurorehabilitation. Her line research is linked to the improvement of visually impaired people's quality of life. She is working with the research group of the renowned researcher, Tomás Ortiz, for the development of a new sensory substitution system for individuals with a visual impairment based on tactile stimulation and neuroplasticity. Tomás Ortiz has developed his model after years of teaching and researching at University Complutense of Madrid. On the other hand, both M. Luz Sánchez-Sánchez and Enrique Varela-Donoso are experts in rehabilitation and biomechanics research. They have a great amount of experience teaching at university and in the treatment of patients with neurological problems, such as stroke.