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## Prospective study on the association of gait parameters with the occurrence of falls in the elderly

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**Objectives:** The objective of this work is to study whether the stride length or the step width predict incident falls in the elderly population.

**Method:** Prospective study on a probabilistic sample of 431 Spanish community dwelling elderly, who were followed for a year. During the initial visit, space-temporal gait parameters were collected by using the ink foot-print method. Additionally, the following control variables were recorded: age, sex, muscle strength, balance, functional capacity, cognitive ability, depression, sensory deficits, comorbidity and polypharmacy. A quarterly telephone follow-up was conducted during one year, in which the number of participants' falls, from the baseline visit or from the previous telephone control, was recorded.

**Results:** The step width was not associated with incident falls. The stride length (normalized by patient's height) showed an inverse association with incident falls at 6 months (OR 0.013,  $p < 0.001$ ) and at 12 months (OR 0.010,  $p < 0.001$ ). Multivariate models (Poisson regression) were performed including the control variables. The stride length reduction was an independent predictor for falls, remaining in the final adjusted model for falls at 12 months, along with strength, cognition, depression, comorbidity and polypharmacy. A decrease in the stride length proved to be sensitive (93%) but not specific (53%) for detecting people at risk for multiple falls in 6 months (AUC 0.73 CI95%: 0.63-0.84). The sensitivity and specificity for detection of recurrent fallers in the following 12 months was 81% and 57% respectively (AUC 0.67 CI95%: 0.56-0.79).

**Conclusion:** We concluded that the stride length reduction is an independent risk marker for falls.

### Biography

Alexandra Herrero-Larrea has completed her Diploma in Physiotherapy at Ramon Llull University in 1999. She has specialized in Manual Therapy at the EFOM in Paris (2003), Master's Degree in Research and Scientific Evidence at the International University of Catalonia (2013). She works as Physiotherapist at the Consorci Sanitari del Garraf since 2004. As a researcher, she has worked in national epidemiological studies, focusing on the analysis of the gait of the elderly, and its association with adverse health outcomes.

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